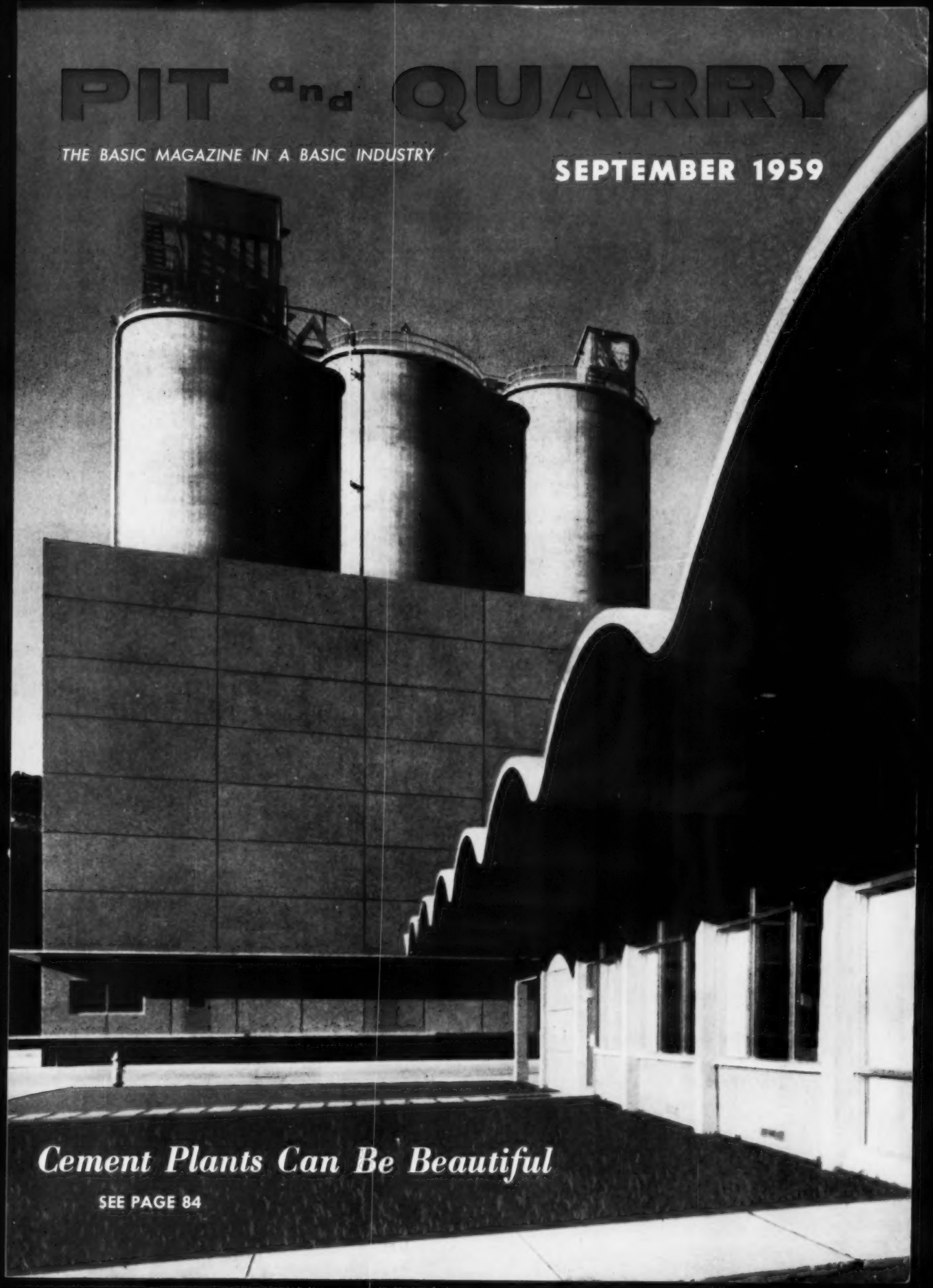
PIT and QUARRY

THE BASIC MAGAZINE IN A BASIC INDUSTRY

SEPTEMBER 1959



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SEE PAGE 84

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says Guy Haney, superintendent for S. Birch & Sons Construction Co.

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PIT and QUARRY

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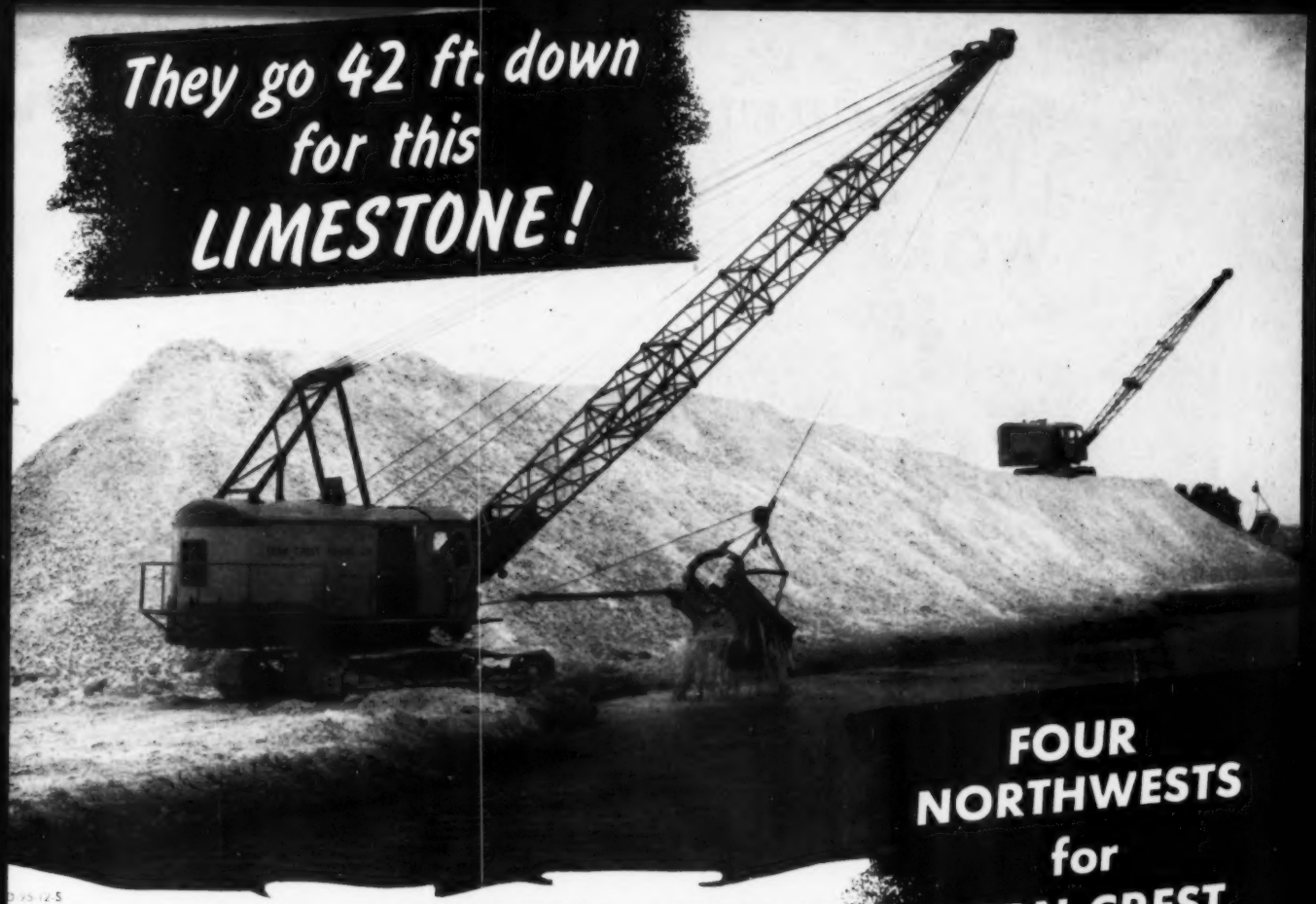

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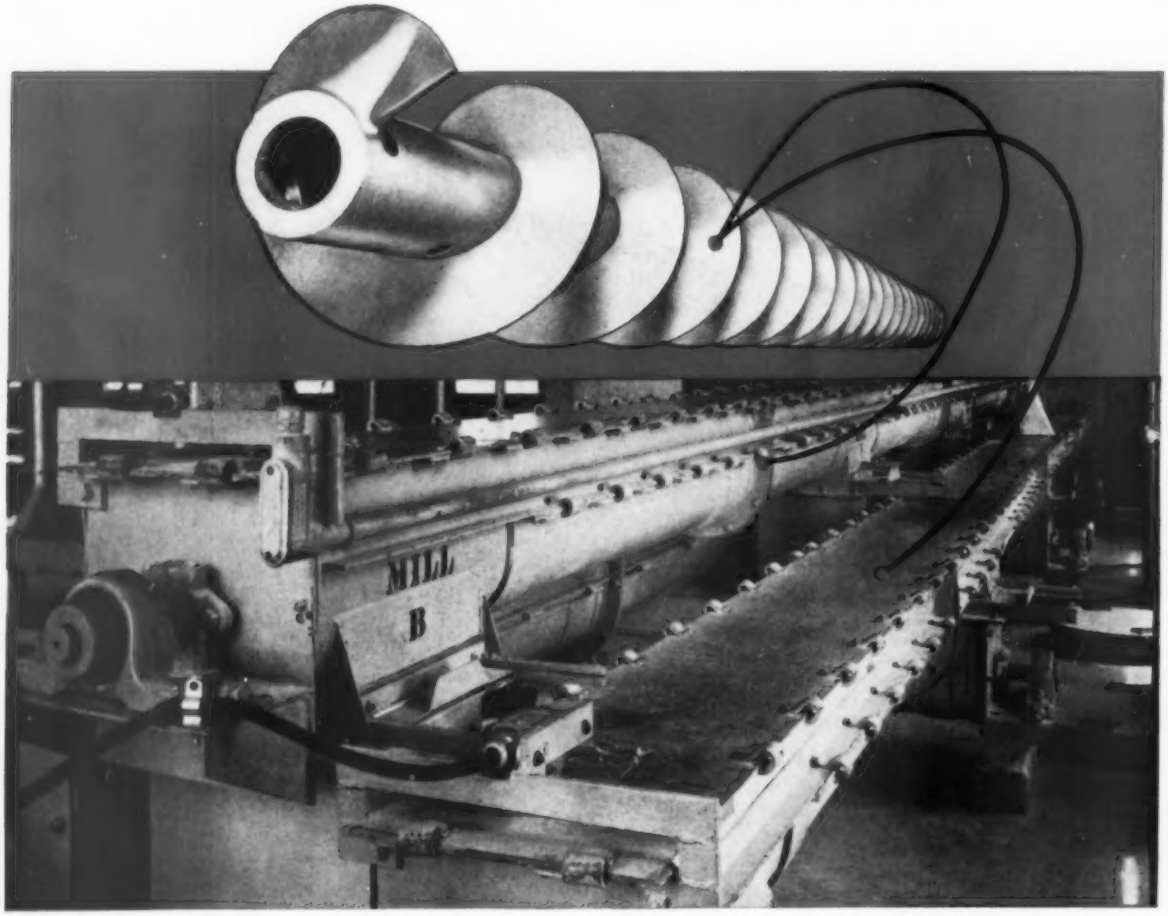

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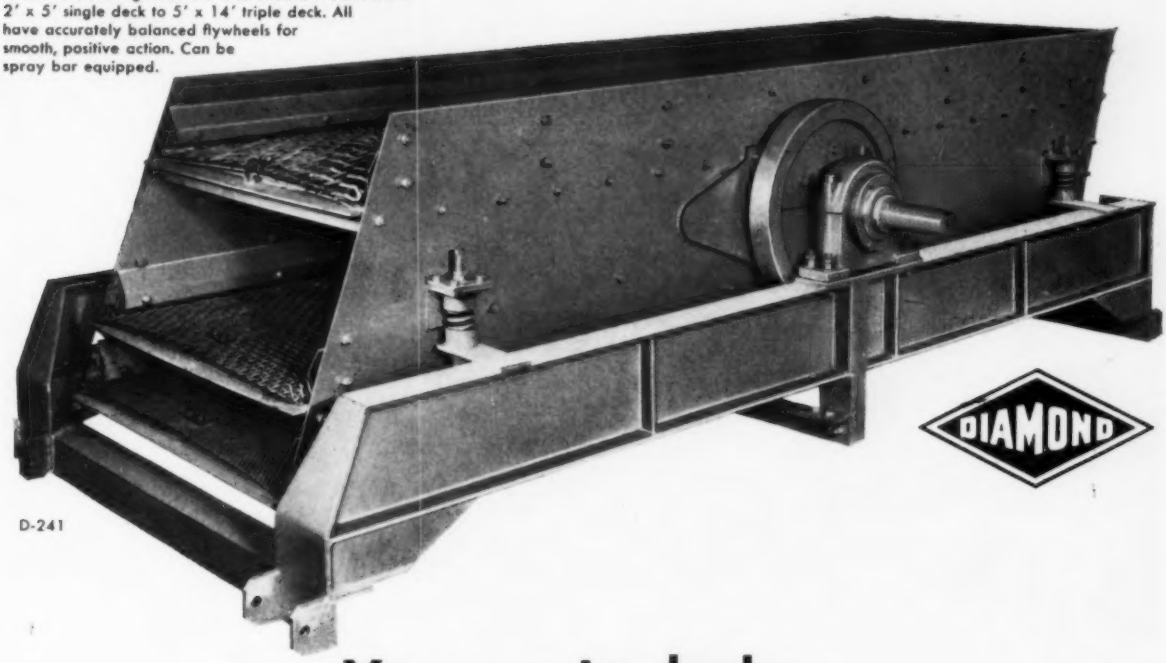

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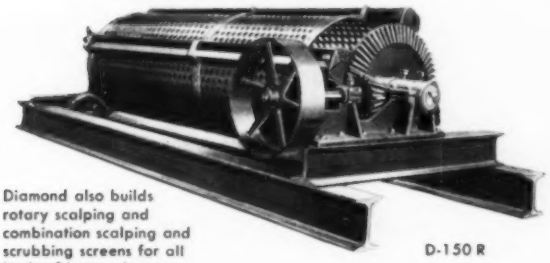

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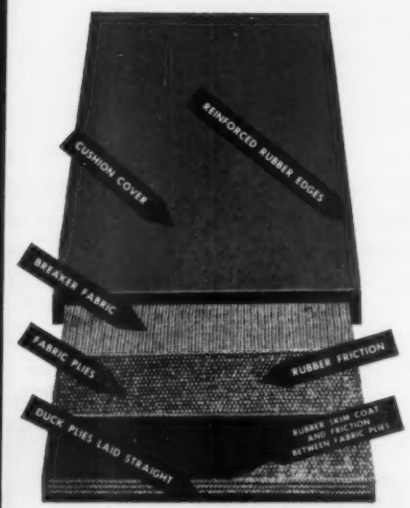

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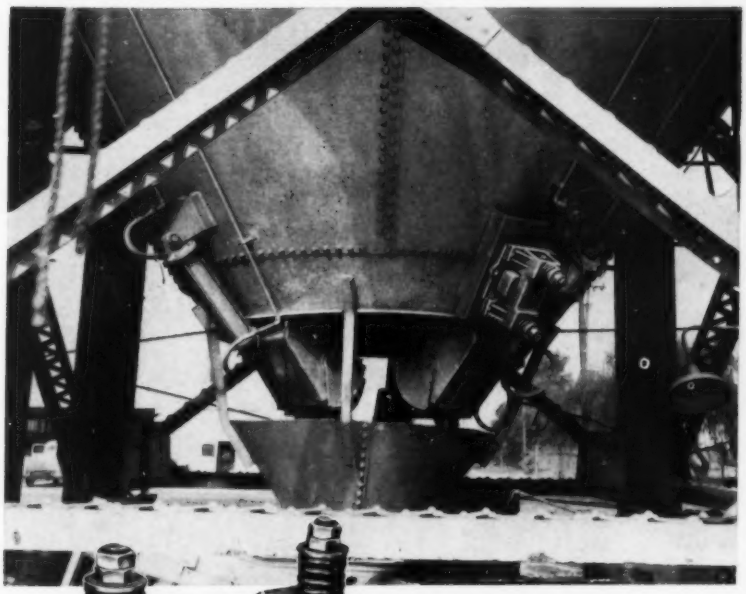
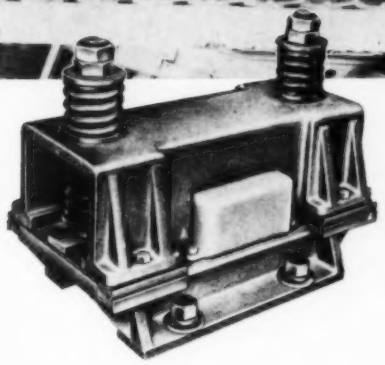


vibrator on rock aggregate bin



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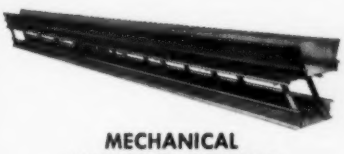

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Washington News Letter

By S. HERBERT UNTERBERGER

PRESIDENT Eisenhower's personal popularity has probably never before reached its present peak. His active participation in policy determination, his firm leadership of Congress, and the international coup resulting from his direct dealings with the heads of other governments, including the Soviet Union, all account for this resurgence of popular confidence in him. Were it not for the two-term Republican-engineered limitation on presidential tenure, developed principally in retaliation against the deceased President Roosevelt, the pressure on President Eisenhower to become a candidate to succeed himself would be almost irresistable.

What the Republicans are hoping is that Mr. Eisenhower will be able to transfer some of his personal popularity to the party and also to the candidates selected to be his possible successor. So far, this has not happened to any extent. To be sure, in the wake of President Eisenhower's *first* victory, some Republicans who might otherwise not have been elected, did win office; but the Party candidates ran well behind the President. Not only did those winning offices receive fewer votes than might have been expected with such a heavy vote for the ticket leader, but, also, the total number elected (and, therefore, the Congressional majority) was much smaller than so large a popular vote for the President would have been expected to produce.

His campaign for re-election, which he won handsomely, was, really, a bitter defeat for the Republican party. It not only lost control of Congress but also of many state governorships and legislatures. The American voter made painfully obvious his discrimination between the President and his party.

Now the opportunity has again presented itself for the President to transfer at least some of his personal popularity to his party. "Can he and will he do it?" is a question being talked about increasingly in Washington.

Opportunities have already been missed. For example, one of the most important of the things that have thrown the Democrats off balance is the fact that the President and not the Democratic Party was right about the 1958 recession. The Democrats regard themselves as experts on economic downturns—after all, was it not the Great Depression of the 1930's which gave them their longest continuous period in office? Thus, from the viewpoint of their political aspirations, the 1958 recession was almost heaven sent.

The formula for success seemed simple enough. The President had already announced that he would be disinclined to take any drastic measures, such as large scale public works, slashing of interest rates, and large government deficits. All they had to do, the Democrats reasoned, was to demand such extreme measures. If they forced the President into a position where he had to do something along the suggested lines, the Democrats would take the credit. If the suggested measure was not taken, the voters would be told that the Republicans were to blame for their economic difficulties.

But then, miraculous to relate, economic forces reversed themselves in the middle of 1958 and the recession turned into widespread prosperity. This literally left the Democrats almost speechless. Senator Lyndon Johnson, the resourceful Democratic leader, made the most of his difficult situation by assuming the role of the most loyal of the loyal opposition by backing the President's economy program.

From the Republican party's point of view, the trouble with this success story is that it is regarded almost everywhere as a personal triumph of the President. The party has received no credit for it and, therefore, very little benefit from it. This would not be so much a matter of concern if the President could run for office again, but, since this is not possible, the victory may be a Pyrrhic one indeed.

One way to effect a transfer of allegiance might be for the President to select his heir-apparent and try to shift the voters' attention to that selectee. While he could probably do this and make his personal choice stick, the President apparently plans to follow a hands-off policy. How else explain the handling of the recent invitation to Premier Kruschev and the reciprocal acceptance of the Russians' invitation to the President? Here was another opportunity missed.

Vice-president Nixon, clearly the most likely Republican presidential candidate, visited Russia and performed an extraordinary job of presenting the American viewpoint with dignity and courage. He was in almost daily contact with Premier Kruschev. Yet, when the invitations were issued and accepted, it was made to look like Mr. Nixon's participation was minimal. Indeed, the President made it clear that the invitation had been "in the works" before Mr. Nixon left for Moscow, and the impression was given that the outcome would have been the same regardless of the success or

(*Continued on page 76*)

COMPARE-

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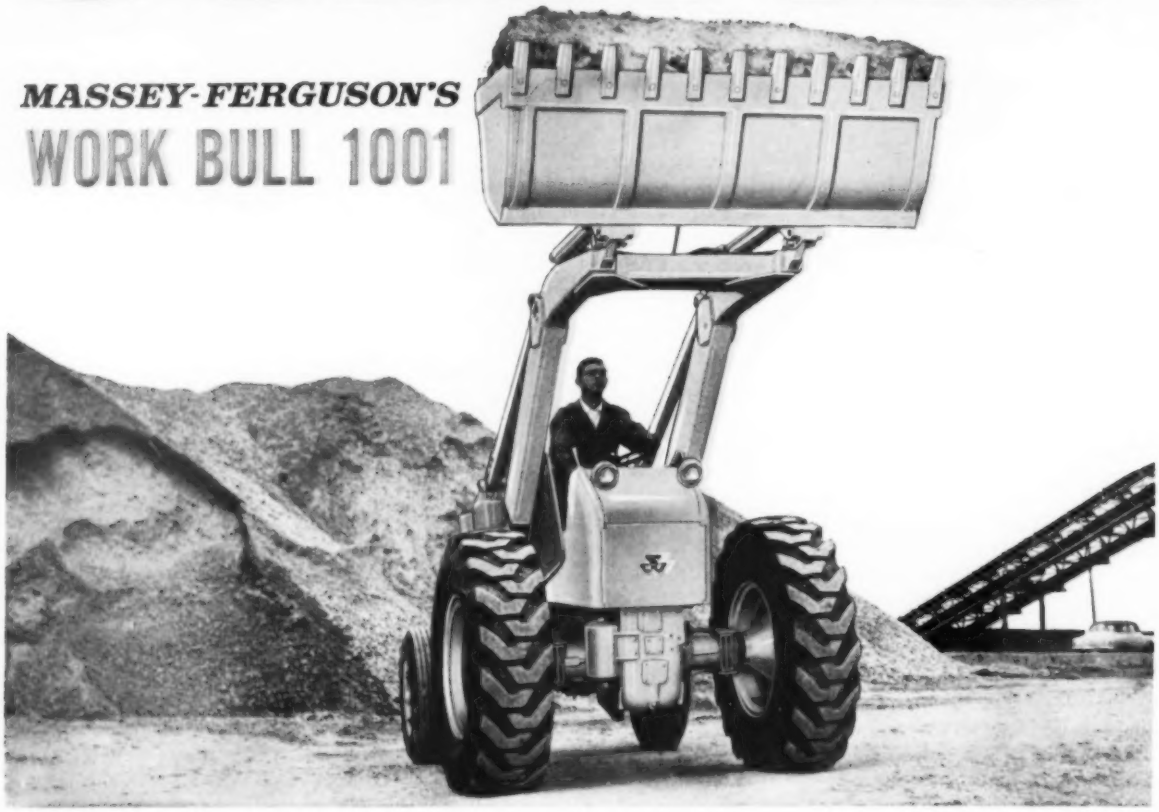

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Labor Developments

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D.C.-Philadelphia, Pa.

NOT so many years ago, an employer engaged on the original construction of buildings or facilities could be reasonably sure that his workers were not covered by the Federal Wage and Hour Law while so engaged. Indeed, the Wage and Hour Division issued an interpretive bulletin which stated directly, ". . . . it is our opinion that employees engaged in the original construction of buildings are not generally within the scope of the Act, even if the buildings when completed will be used to produce goods for (interstate) commerce. . . ." The courts went along with this interpretation and drew a distinction between work on the original construction of buildings or facilities to be used in interstate commerce, which was not covered by the Wage and Hour Law, and their repair and reconstruction which was covered.

Interpretation Change Begins

Occasional attempts were made to obtain regulations and court decisions which would change, or even only chip away at, the application of this general rule. Until 1955, the rule held pretty much intact. Around that time the U. S. Department of Labor changed its collective mind. It arranged for the prosecution of a case against an employer who thought he was not covered by the Federal Wage and Hour Law and, therefore, did not observe fully its overtime penalty provisions.

He was engaged in the construction of an earthwork embankment and a concrete platform for a canal lock which was part of the Gulf Intra-coastal Waterway, which extends from Florida to the Mexican border. This canal lock was part of an alternate route to one already in operation.

Despite the fact that the Government agreed that this was new construction and not "repair or reconstruction," it contended, nevertheless, that the work was in interstate commerce, and, therefore, covered by the Wage and Hour Law. Accordingly, it found the employer in violation and attempted to make him pay additional amounts plus possible penalties. The case went all the way to the U. S. Supreme Court.

The company relied on the precedent of a previous Supreme Court case where it was held that an employee at work on a new tunnel for an interstate carrier was not subject to the Federal Employers' Liability Act, even though the tunnel, when completed, would be an interstate facility. The Supreme Court brushed this aside with the statement that, "We are dealing with a different Act of another vintage—one that has been given a liberal construction. . . ." It went on to say that the question of whether or not an employee is covered is governed by practical considerations, not by technical conceptions.

In that relation, the Court pointed out that the Gulf Intra-coastal Waterway is an existing instrumentality of interstate commerce, that the existing lock could no longer handle the traffic, and that it was impractical to widen that lock. Therefore, it reasoned, the construction of the new lock had as intimate a relation to the improvement of navigation on the waterway as if the old lock had been dredged. Thus, the Court concluded, it is really part of the redesigning of an existing facility of interstate commerce.

For a while, it was thought that this decision might be narrow enough so that it would have little effect on the basic rule, but this has not proved to be so. As it turned out, this decision began a trend, so that it is increasingly difficult to find new construction which can not be construed to be covered by the Federal Wage and Hour Law.

Three Examples of Trend

Following this trend, in recent weeks a Federal court in Illinois ruled that construction of a new tunnel for a metropolitan waterworks system was covered by the law because the customers of the system included interstate manufacturing plants. This court decided that all that was needed was a close relation to the production of goods for interstate commerce.

Similarly, a Federal court in Kansas ruled that the law applied to the construction of grain elevators which were intended for use in the storage of grain purchased by the government in pursuance of its price support program. This was also based on the theory that the new elevators were closely related and directly essential to the production of goods for interstate commerce.

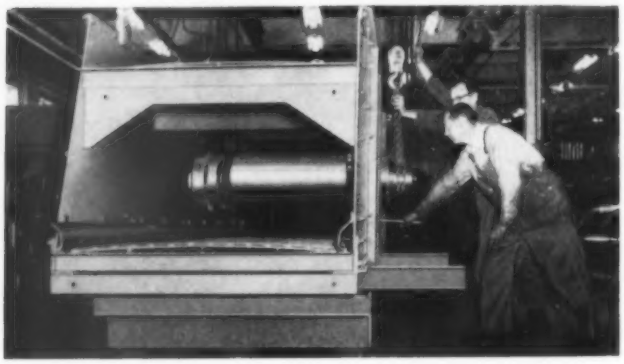
Finally, a Federal court in Virginia has ruled on a case which might be of special interest to pit and quarry operators who are considering the development of new facilities. A firm which was not yet in the mining business built new buildings and installed machinery for the mining of manganese ore. This ore was to be sold to the U. S. Government and shipped to a local national defense stockpile. While the construction was underway, no ore was being mined. Nor was the employer in the mining business

(Continued on page 76)

This is the place . . .

Yes, right here in the SECO plant, from drawing board to shipping dock, starts the dependability and screening efficiency that pays off when meeting rigid specifications.

that makes the screens . . .



That's because vibrating screens are our business . . . our only business . . . and customer satisfaction is what keeps us in business. SECO uses every means possible to assure this satisfaction in more than 500 vibrating screen models. All phases from design to fabrication and final assembly, are fully controlled here by modern machinery and experienced men . . . the extra margin of safety for your peak operating schedule is a constant consideration at SECO.

that insure your profits . . .

And here's where SECO's superiority really pays off for you . . . on the job . . . up to 24 hours a day . . . year after year . . . meeting the most rigid specifications with precise sizing accuracy. It will pay you to take advantage of SECO's quarter century of vibrating screen experience.

Send for TWIN BEARING booklet TB-21 and 4-BEARING catalog No. 204

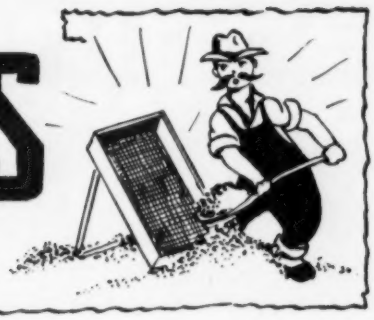
SCREEN EQUIPMENT CO., INC.

Buffalo 25, New York

SECO

VIBRATING SCREENS

SCREENINGS



By RAY L. SMITH JR.

IF YOU ARE a follower of the comic strip Lil' Abner you have been subjected to a real insight as to how foreign aid operates. While Dogpatch was a country in its own right the people were getting things they had no earthly use for.

But when it was discovered that Dogpatch was a piece of the U. S. afterall, well, brother, the story changed.

The absurd strip allowed that a $20 loan could not be made the Dogpatchers.

Madcap Al Cap is probably earning some very evil stares from the dispensers of the world's biggest give-away sponsor.

And, of course, all of this is absurd . . . isn't it?

Book Department

THERE'S no appeal like snob appeal, reckons Vance Packard in his new best seller, "The Status Seekers."

Author Packard tells why the wife wants to keep up with the Jones family, why the old guys prefer convertibles and sawed-off imports.

Packard guesses there's a little snob in everyone and therein lies the secret of mink-lined can openers and men's frilly shirts.

Potpourri and Succotash

"How did you spend this hot week-end?"
"Fishing through the ice."
"Fishing through the ice? For what?"
"Olives."

Irite Customer: "What! You sell cigars in here but prohibit smoking?"
Sales Girl: "We also sell bath towels."

He: "Darling, how can I ever leave thee?"
She: "By train, bus, street car or taxi."

The boss had just complimented his new secretary on her appearance, personality and deportment.

"Oh, thank you," she gushed.

"Enjoy those compliments to the fullest," he retorted, "for now we're going to talk about your spelling, punctuation and typing."

Freshman: "What shall we do tonight?"
Sophmore: "We'll toss a coin. It it's heads, we'll get dates. If it's tails, we'll go to the movies stag. If it stands on edge, we'll study."

It's better to give than to receive, and besides it's deductible.

After standing in line for 20 minutes, the moviegoer arrived at the box office and asked for a ticket in the orchestra.

"That'll be $1.85," said the girl behind the glass.

The man glanced at a sign over the box office and grunted, "It says 'popular prices' on the sign. You call $1.85 a popular price?"

"Well," said the girl sweetly, "*we* like it."

The police sent out pictures of an escaped convict in six different poses. A constable sent the following wire: "Have captured five of them and on trail of the sixth."

An American in Wales noticed the words, 'Tam Htab' on a mat in his room. 'Ah!' he said to the bellboy, 'I suppose that's Welsh for Welcome.' 'No, sir,' grinned the boy, 'that's the bath mat upside down.'

There are all sorts of signs hanging in business offices to stimulate thought, bring a chuckle or encourage productive activity, signs such as Think, and What Kind Of A Day Can You Expect When It Starts With Getting Up In The Morning? One enterprising business man, striving for efficiency in his organization, hung up one which said Do It Now! Within 24 hours, his cashier bolted with the contents of the safe, the stenographer eloped with his eldest son, and the office boy threw an ink bottle into the electric fan.

Clerk behind a cosmetics counter:

"There's no tax on this perfume—the type of man it attracts isn't considered a luxury."

Customer—"Have you any good after-shave lotion?"
Clerk—"Yes, here's a little number that drives the girls crazy. It smells like a new car."

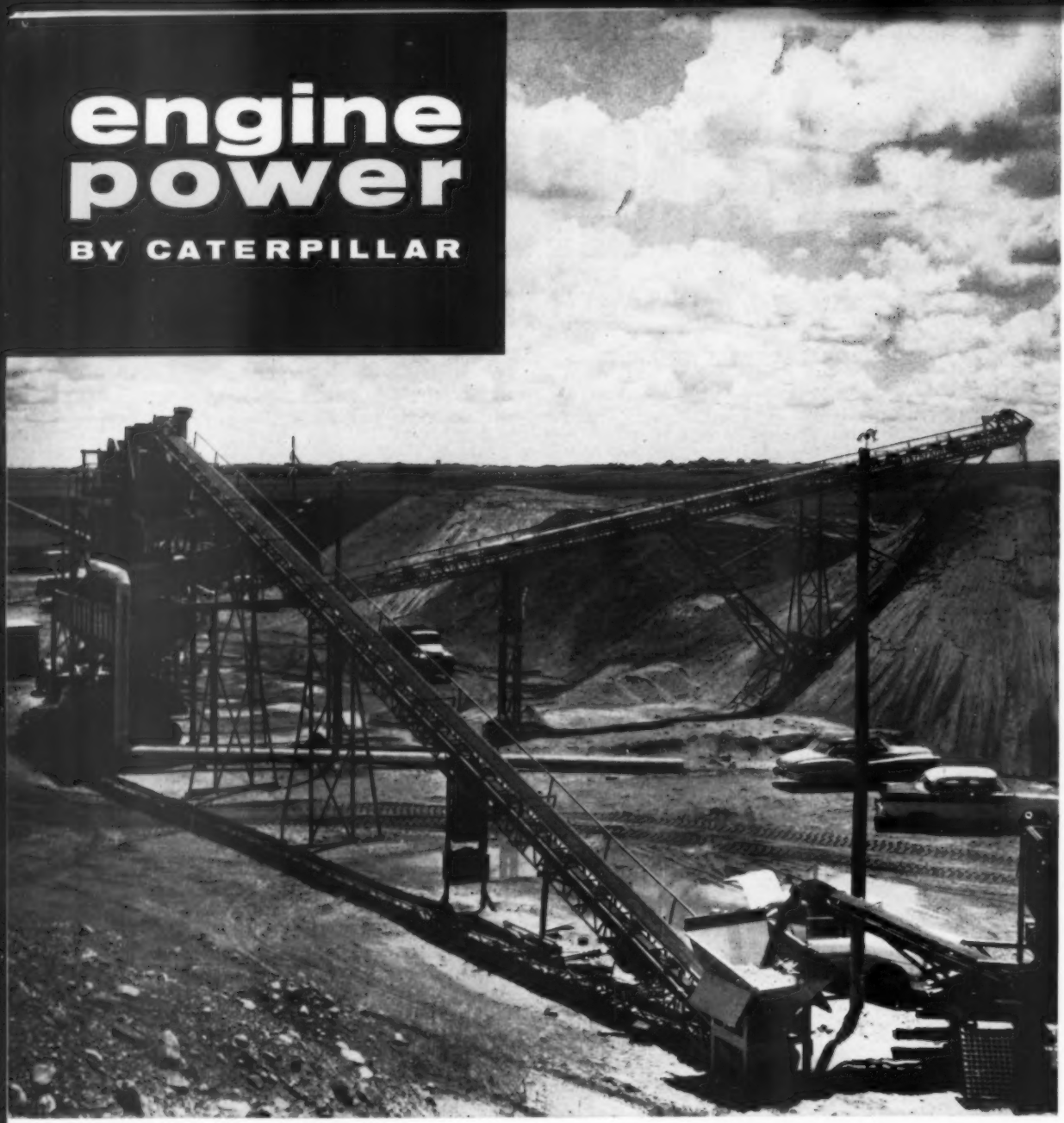
A young father was pushing a baby carriage in which an infant was screaming. Wheeling the howling baby along, he kept murmuring gently, "Easy now, Donald. Keep calm, Donald. Steady, Boy. It's all right, Donald."

A mother passing by paused to say, "You certainly know how to talk to an upset child—quietly and gently." Then leaning over the carriage, she said, "What seems to be the trouble, Donald?"

"Oh, no," said the father. "He's Henry. I'm Donald."

Nagging Wife—Are you sure you'll love me when I am old and ugly?
Husband (reading paper)—Sure I do.

engine power
BY CATERPILLAR



A FINE EXAMPLE OF A MODERN OPERATION

SOME

PLANT

MODERNIZING

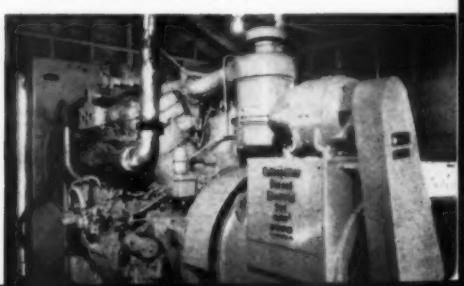
IDEAS

OFF-PLANT POWER

This owner took the diesel away from plant vibration and dust, put a large-capacity fuel tank on the flat bed and made screen changing easier. This cut down on both engine and plant down time.

FULL ELECTRIC POWER

This D375 Electric Set replaced commercial power in Ohio sand and gravel plant, reducing primary power costs 60% and ending power failure and low-voltage problems. Owners say it will pay for itself in 3 years.



Enter 16 on card, page 177

ARE YOU A COLLECTOR OR A PRODUCER?

A Quick Count of Diesels on Your Machinery Will Give You the Answer

In the process of expansion, many aggregate producers have accumulated an excessive amount of small power units. They range from small gasoline electric sets mounted where only motors should be to 25-year-old Cat Diesels, still performing well, but lacking many production-boosting changes.

These small and old engines promote inefficiency. Most are in key areas and any failure could cause down time. Servicing is continuous . . . fuel and oil supply is a concern. Start-up and shut-down are major operations each day. Fuel costs are excessive and, above all, this complex of power encourages inefficiency on the part of operating and maintenance personnel on the job.

On crushers, up to a ton of headache-causing cross shafts, jack shafts, pulleys, belts and gear boxes can be eliminated by partial electrification.

How can you become more efficient?

1. Add all your mechanical horsepower requirements on the plant.
2. Add KW requirements also.
3. See your Caterpillar Dealer and specify direct drive from the flywheel to handle mechanical requirements and a large-capacity front-mounted generator to handle your electrical load.

Only Cat Diesels can take full horsepower from the front! On your next diesel purchase, take advantage of the strength and versatility of a Cat Diesel Engine. Over 250 quality manufacturers offer these heavy-duty diesels in crushers, washing plants, excavators, compressors, drills, locomotives and pumps. The line ranges up to 700 HP. See your Caterpillar Dealer for more complete details.

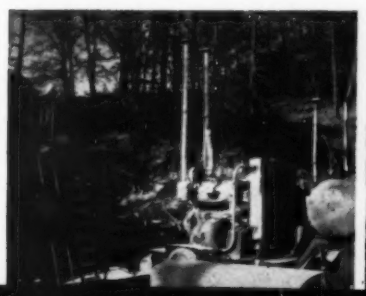
CATERPILLAR

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

VERSATILE POWER

This D375 V-8 direct drives a 40" hammermill while a belt-driven generator powers conveyors, lights and welders when needed. A sister D397 V-12 replaced four engines on a nearby plant of the same Minnesota Company.



CONTROLLED POWER

Operator has control at finger tips using off-plant mounted D337 Series F two-handed power unit. Constant mechanical drive keeps crushers moving. Screens and delivery conveyors have start-stop motors. Variable speed motor on field conveyor keeps screens loaded.

BIG ENGINE POWER

This Kentucky aggregate producer traded in a number of small gasoline and diesel engines in 1956 for a Cat D397 Electric Set. Getting remote power in one package cut fuel consumption 50 gallons per day and eliminated an hour's start-up time each morning.

MOVING DAY

The Finest Products
Made with Aluminum
are made with
REYNOLDS ALUMINUM

for a mountain!

Aluminum dump truck bodies prove their toughness in roughest hauls... carry more payload... with less maintenance

If payload and strength is important to you, consider this:

The pounding impact of tons of rock . . . the abrasive wearing action of loading and unloading . . . this is the beating a dump truck takes. And dump truck bodies and trailers are now being built with Reynolds Aluminum for the construction and mining industries where equipment performance and life are closely measured.

Yes, lightweight aluminum weighs far less than steel, yet has the strength and toughness for bruising mining and construction work.

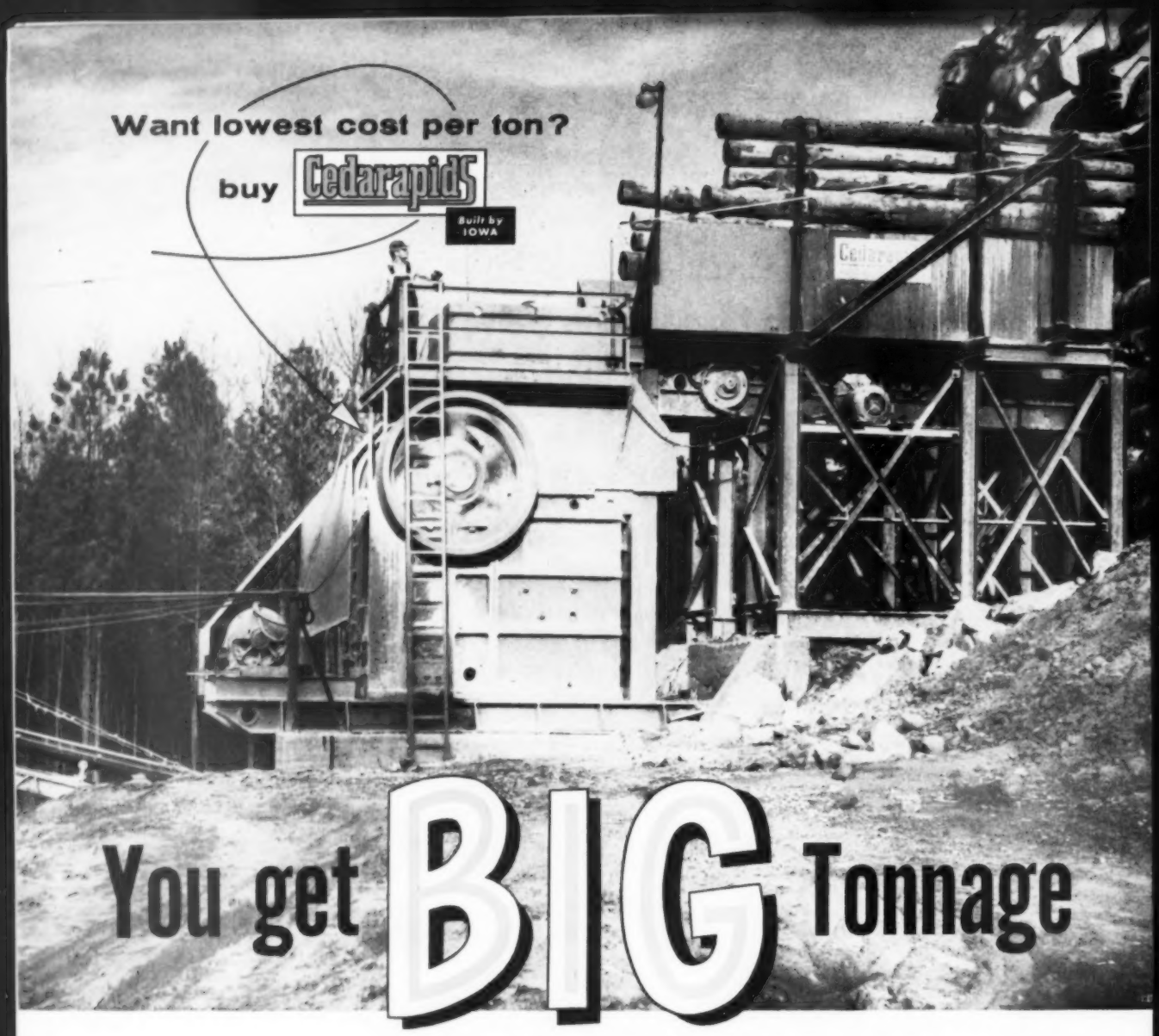
Because they're lighter, aluminum dump truck bodies carry more payload—35% to 50% more. This means mountains get moved faster . . . fewer trips . . . lower cost . . . higher profit.

And aluminum dump truck bodies are naturally rustfree, resist corrosion, require minimum maintenance (a simple hosing keeps them clean).

For more details on aluminum dump bodies and trailers or the names of manufacturers, call your nearest Reynolds Office or write *Reynolds Metals Company, P.O. Box 2346-VQ, Richmond 18, Virginia.*

REYNOLDS ALUMINUM

Watch Reynolds TV shows—"ALL-STAR GOLF" and "ADVENTURES IN PARADISE"—ABC-TV



with Cedarapids 42" x 48" Jaw Crushers

Here's the way to handle your *big* primary crushing jobs profitably. This Cedarapids 42" x 48" Jaw Crusher will take a piece of solid rock weighing over 6,250 lbs., reduce it to 4" minus material, and turn out 200 tons per hour! It will produce up to 775 tons per hour of 15" minus. In the installation shown above, owned by Clement Brothers Co., Pomaria, South Carolina, the primary jaw crusher is stock-piling material ranging in size from 5½" to 6". Material is then conveyed to a Cedarapids 5' x 12' Double-Deck Inclined Screen, two Cedarapids Horizontal Vibrating Screens and two cone crushers used for secondary crushing of oversize from the screens. The plant easily handles 300 tons per hour and the primary jaw crusher keeps it going full blast. A high-output, low-maintenance operation like this makes money!

IOWA MANUFACTURING COMPANY •
Cedar Rapids, Iowa

Gentlemen: Please send Bulletin JC-1 and more information about the BIG 42" x 48" Jaw Crusher.

Name_____ Title _____

Company _____

Address _____

City_____ State_____

Get complete details about the greatest combination of high-capacity features ever built into a jaw crusher. Ask about the precisely engineered overhead eccentric, balanced force-feed design; extra power with heavier-than-average flywheels; hydraulic rams for fast size adjustments; rigid, stress-relieved base fabricated with heavy rib-reinforcements; the *many* other low-maintenance, big-production features.

IOWA MANUFACTURING CO.
Cedar Rapids, Iowa

new model H-50 PAYLOADER®

5000 lb. carry capacity... 3/4 to 2 yd. buckets

The model H-50 is the successor to the model HU in the "PAYLOADER" line of 4-wheel-drive tractor-shovels, and is another example of the continual development program that has maintained Hough leadership in tractor-shovel design and performance. It contains a number of improvements that give it outstanding performance for a machine in this size range.

BALANCED DESIGN Hough "balanced-design" provides correct weight distribution plus a proper balance between power, drive-train components and hydraulic system consistent with the handling of maximum tonnages.

MORE POWER The H-50 gives you a choice of gasoline or diesel engines, and more horsepower in both types — 92 hp gasoline, 90 hp diesel. These bigger engines provide more power for both propulsion and hydraulics without "lugging down".

EASY, FULL-POWER OPERATION Power-shift transmission with three speeds forward and reverse, plus easy power-steer and 4-wheel power brakes assure fast operation with minimum operator effort... promote a high production rate the full shift.

PROTECTED FOR LONG LIFE Sealed front brakes, complete filter protection for engine and hydraulic systems, hypoid differential with power-transfer feature, and planetary final drives are some of the many design details that will assure low maintenance, reliable service and long life.

MORE ATTACHMENTS... MORE USES The widest choice of attachments are available, including these exclusive ones: Drott 4-in-1 bucket, Wain-Roy Backhoe, Vibratory compactor, Ram Black-top spreader ... also blower, "V" and blade plows, angling backfiller, back-rip scarifier, winch and others.

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☐ Send data on H-50 "PAYLOADER".
☐ Other "PAYLOADER" units to 12,000-lb. carry cap.

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Company _____
Street _____
City _____ State _____

9-8-3

Truck-mounted REICHdrill Model T-750.

REICHdrill Model T-450 drilling coral.

IN QUARRYING OPERATIONS

REICHdrills give you MUCH more hole per day

And here are 4 rugged reasons why:

1. Variable rotation speed gives you exactly the right RPM for any material, rock to rubble.
2. Minimum of control levers for all operations means fast, easy handling by one man.
3. All controls actuated by smooth hydraulic power, saving operator time and tiring.
4. Extra heavy-duty construction on all component parts, including pumps, gears and frame means rig can take long, high speed duty without costly maintenance. Plus other field-proven features like hydraulic stem loader and down-the-hole hammer.

Units can be supplied truck or crawler mounted to suit operating conditions. Holes up to 12″ diam. Down pressure to 75,000 lbs. Write for detailed information on REICHdrills.

REICHdrill *Division: Chicago Pneumatic Tool Company*

1439 ASH STREET, TERRE HAUTE, INDIANA

News of the Industry

Louisiana Lime Plant, Gypsum Plant Expansion Set for U.S. Gypsum Co.

Directors of the United States Gypsum Company, Chicago, Ill., have authorized construction of a lime plant at New Orleans, La., adjoining the company's gypsum products plant. The new plant will produce high purity quicklime and hydrated lime products from shell obtained nearby.

Cost of the project was not disclosed, but the project was described as sizable. At the same time, plans were announced to enlarge the existing gypsum board plant at Jacksonville, Fla.

F. X. Courtney Marks 25 Years With Material Service Corp.

Francis X. Courtney, vice-president of Material Service Corporation, recently celebrated the 25th anniversary of his association with the company. In recognition of the occasion, he was presented with a gold watch by Irving Crown, president, at a luncheon in the company offices.

After joining the firm as a part-time office boy in 1934, at the age of 17, Mr. Courtney served in the sales department in various capacities. He became assistant secretary of the firm in 1956.

F. X. Courtney, right, receives a gold watch from Irving Crown in recognition of his 25 years of service.

Silica Sand Producing Plant To Operate Near Guion, Ark.

A new silica sand production plant, called the National Silica Products Company, will start operations soon near Guion, Ark. Principals in the new enterprise are Hayden Bursey, who will manage the firm, and J. A. Rodman.

The plant site is located three miles north of Guion. The deposits are in a mountain alongside the Missouri Pacific Railroad. Production of foundry sand is expected to begin by October. Output will be shipped to Shreveport, Tulsa, Oklahoma City, and Dallas.

Coming Events

September 14-17, 1959—Denver. Metal-mining industrial minerals convention, American Mining Congress.

September 23-26, 1959 — Bedford, Pa. Joint meeting, Industrial Minerals and Coal Divisions, Society of Mining Engineers of A.I.M.E. Bedford Springs Hotel.

September 27-30, 1959 — Lake Placid, N.Y. Semi-annual meeting, board of directors, National Sand and Gravel Association. Lake Placid Club.

October 1-3, 1959 — Philadelphia. Operating meeting, National Lime Association. Sheraton Hotel.

October 11-16, 1959—San Francisco. Third Pacific Area national meeting, American Society for Testing Materials. Sheraton-Palace Hotel.

October 19-23, 1959—Chicago. 47th National Safety Congress. Mining Section sessions, Congress Hotel. Headquarters, Conrad Hilton Hotel.

October 29-30, 1959—Boca Raton, Fla. 42nd Annual Meeting, National Slag Association. Boca Raton Hotel and Club.

1960

January 18-21, 1960—Cincinnati, Ohio. 58th Annual Convention, American Road Builders Association. Netherland Hilton Hotel.

January 18-21, 1960—Washington, D.C. Board of Directors meeting and Annual Convention, National Limestone Institute. Statler-Hilton Hotel.

February 1-5, 1960—Chicago. Committee Week, American Society for Testing Materials. Hotel Sherman.

February 15-19, 1960—Chicago. Combined Biennial show, joint convention, National Sand and Gravel Association, and National Ready-Mixed Concrete Association. The Coliseum, and Conrad Hilton Hotel.

February 22-24, 1960—Chicago. 43rd Annual Convention, biennial manufacturers division exposition, National Crushed Stone Association. Conrad Hilton Hotel.

February 22-24—Los Angeles. Fortieth Annual Convention, National Concrete Masonry Association. Hotel Statler.

Despite Ups and Downs, June Building Contracts Near Peak, Dodge Reports

Construction contracts in the United States in June rose sharply over May on a seasonally adjusted basis, according to F. W. Dodge Corporation, although they are still slightly below the all-time peak reached in June of last year. The dollar value of contracts in June was $3,659,017,000, down 4 percent from June, 1958.

Dr. George Cline Smith, Dodge vice-president and economist, evaluated the decline of 4 percent on the year-to-year comparison as negligible, in view of the fact that June, 1958, "was the highest month ever recorded, partly because of government stimulation of housing and highways as an anti-recession measure at that time. The current figure is almost as high, but without these special stimulants."

The greatest gain over last year was the manufacturing building category, up 89 percent from June, 1958. "The long-awaited upturn in industrial building is now well established," Dr. Smith declared. "It is true that this category was unusually low a year ago, but an 89 percent increase is remarkable under any circumstances."

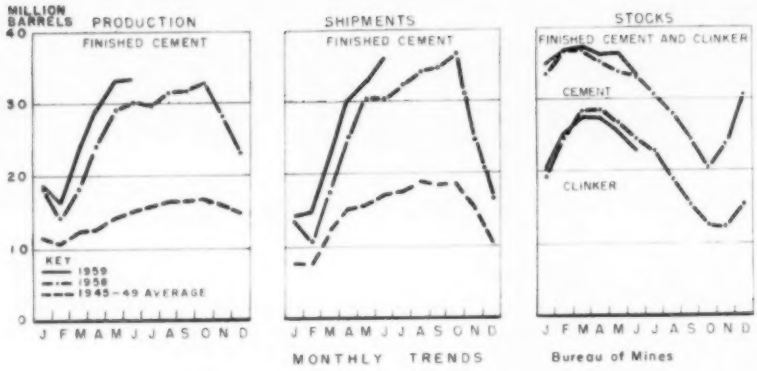
Other sharp gains were in apartment buildings, up 46 percent over June, 1958; one- and two-family houses, up 30 percent; and commercial buildings, up 24 percent.

On the negative side, the heavy engineering categories generally made a poor showing in June, with declines in all types except sewerage systems. Declines were particularly sharp in contracts for electric light and power systems, highways and airports. Total heavy engineering contracts were $842,063,000, down 43 percent.

The fact that total June contracts were at such a high level despite the sharp decline in heavy engineering has been interpreted to show the great strength in the residential and non-residential building fields. Total residential contracts for June, at $1,761,621,000, were up 29 percent from last year; non-residential buildings, at $1,055,333,000, were up 8 percent.

As for heavy engineering, Dr. Smith believes the decline in highways was to be expected because of last year's abnormal speed-up as a recession-curing device. The other heavy engineering groups are subject to sharp fluctuations because of the influence of large projects, and not too much significance should be attached to a short-term dip.

Cumulative figures for the first half of 1959, with percentage changes from the corresponding period of last year, are as follows: non-residential buildings, $5,717,560,000, up 4 percent; residential, $8,884,451,000, up 37 percent; heavy engineering, $4,273,533,000, down 11 percent; total construction, $18,875,544,000, up 12 percent.



— June, 1959, Finished Portland Cement —

SUMMARY—Production of finished portland cement in June, 1959, as reported to the U. S. Bureau of Mines, totalled 33,455,000 bbl., an increase of 11 percent over June, 1958. Mill shipments in June, 1959, totalled 36,082,000 bbl., an increase of 19 percent over June, 1958. Stocks of 33,621,000 bbl. of finished portland cement on hand were 1 percent more than those on hand June 30, 1958. Clinker production during June, 1959, totalled 30,753,000 bbl., an increase of 10 percent over the June, 1958, figure.

PRODUCTION—One hundred and sixty-nine (169) plants in 38 states and Puerto Rico reported a production of 33,455,000 bbl. of finished portland cement during June, 1959, compared with 30,078,000 bbl. produced in June, 1958.

Production of clinker during the month of June, 1959, was 30,753,000 bbl. compared with 27,925,000 bbl. during the same month last year.

High-early-strength portland cement in June, 1959, totalled 1,337,000 bbl., an increase of 47 percent over the June, 1958, production.

Prepared masonry cement production in June, 1959, of 1,578,000 bbl., increased 11 percent over the June, 1958, production.

SHIPMENTS—Mill shipments of finished portland cement for June, 1959, totalled 36,082,000 bbl. compared to 30,262,000 bbl. in June, 1958.

In June, 1959, shipments were higher in 22 districts and lower in 1 district than in June, 1958. The greatest increases were in the eastern Missouri-Minnesota-South Dakota, Ohio, and Michigan districts.

Mill shipments of high-early-strength portland cement totalled 1,385,000 bbl. in June, 1959, a 30 percent increase over the 1,066,000 bbl. shipped in June, 1958.

Mill shipments of prepared masonry cement in June, 1959, totalled 1,663,000 bbl., an increase of 20 percent over the 1,391,000 bbl. shipped in June, 1958. Over one-half of these shipments were from mills in the northern states east of the Mississippi River. Prepared masonry cements are shown in 376-lb. barrels although they are sold in barrels of varying weights.

STOCKS—Mill stocks of 33,621,000 bbl. of finished portland cement were on hand June 30, 1959, an increase of 1 percent over the 33 350 000 bbl. on hand June 30, 1958. Stocks of clinker on hand June 30, 1959 totalled 22,931,000 bbl., a decrease of 6 percent from the 24,372,000 bbl. on hand June 30, 1958.

FIRST SIX MONTHS OF 1959—For the January-June period, 1959, the volume of production of finished cement amounted to 155,619,000 bbl., compared with 133,746,000 bbl. in the comparable period of 1958. Total shipments for the first six months of 1959 are reported at 151,421,000 bbl.; in the same period of 1958 total shipments were 128,038,000 bbl. ●

Robert J. Wolf, vice-president, Kaiser Engineers, will be in charge of the firm's newly established district offices at 228 North LaSalle St., Chicago, Ill. The new offices were set up to serve the industrial, construction, and engineering requirements of the firm's clients in the mid-west and eastern areas.

reports G. A. Johnson, Salina Sand Co., Inc., Mentor, Kan.

For over ten years Salina Sand Co., Inc., has successfully employed Eagle Washing Equipment. Various units have been added from time to time. Their present modern, versatile plant is pictured. Eagle Equipment includes a double 32′ Water Scalping-Classifying Tank with automatic bleeder valves and metering "splitter" gates, two Double Screw Fine Material Washers, one 22″ x 18′ and one 36″ x 22′, and two Coarse Material Washers, one 24″ x 18′ Single Screw, and a 30″ x 18′ Double Screw. Salina's dredge with 10″ pump is equipped with a 75′ light duty Eagle "Swintek" Dredging Ladder, shown below.

With this plant they can readily meet material specifications of the state and other governmental bodies. They produce mason sand, concrete sand, cover material and road gravel. In addition to giving them the desired classifications of sand, Salina's Eagle plant thoroughly washes out clay and dirt frequently encountered in the deposit. The "Swintek" ladder on their dredge cuts costs and increases production by increasing intake of solids and by completely eliminating shutdowns from clogged suction lines.

Salina Sand Co., Inc., is happy with their Eagle Equipment — a sound investment protected by Eagle's vast experience and far-reaching service policy. Send for Catalog 58 on Washing-Classifying-Dehydrating Equipment. Catalog 83 Dredging Equipment.

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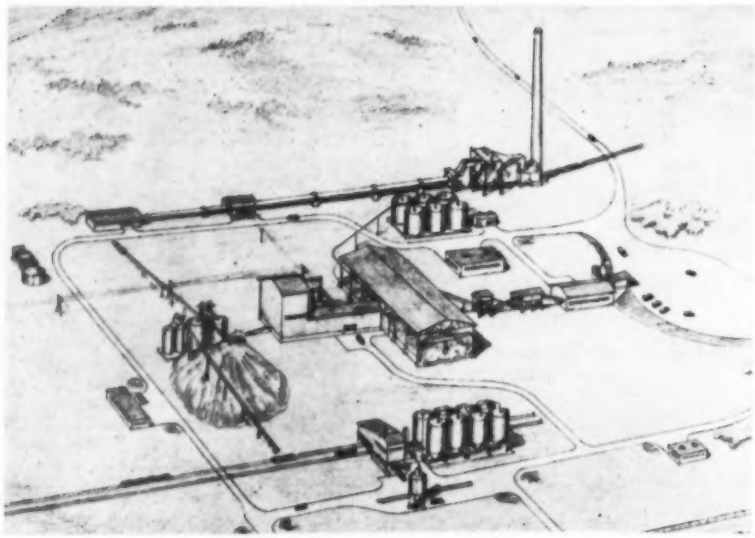

Overall site plan of Texas Industries' $14,000,000 proposed cement plant.

Texas Industries, Inc., Enters New Field with $14,000,000 Cement Plant

Construction will begin this month on a wet process cement plant at Midlothian, Tex., for Texas Industries, Inc., of Dallas. The 1,400,000-bbl. capacity plant is expected to be in operation by the end of 1960.

It is the first cement plant for Texas Industries, which was established in Dallas in 1950 and has grown to become the world's largest producer of lightweight aggregate for structural concrete. The firm is also one of the nation's leading producers of lightweight masonry units, concrete brick, and precast and prestressed structural concrete elements.

Estimated cost of the facilities is in the neighborhood of $14,000,000. Limestone and shale reserves at the plant site are reported as a 300-year supply. The 1,300-acre tract is about 25 miles from Dallas and 30 miles from Fort Worth. It will be served by a spur from the Santa Fe Railroad.

The construction contract has been awarded to Turnbull, Inc., engineers and construction managers of Dallas and Cleveland. Virgil Sewell, Dallas, will be co-ordinator of production at the plant.

Common stock of Missouri Portland Cement Company, St. Louis, Mo., has been accepted for listing on the New York Stock Exchange.

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A proven profit maker. Controls and guarantees your product. Fast, accurate, trouble-free.

For sizing test samples of crushed stone, sand and gravel, slag and similar materials in a size range from 4-in. to 200-mesh.

GILSON TESTING SCREEN
with motor, dustpan tray and 5 coarse series screen trays..$500 FOB Malinta, Ohio
Shipping Weight.....500 lbs.

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SAMPLE SPLITTER

Reduces large samples for convenient testing. Adjusts for all materials, sand to heavy aggregate. Simple to use. Heavy welded steel construction.

SAMPLE SPLITTER
complete with two material pans and bag-loading chute..$125 FOB Malinta, Ohio
Shipping Weight, crated.....195 lbs.

GILSON SCREEN CO.
MALINTA, OHIO

Enter 26 on card, page 177

New York Railroad Line Grants Rate Reduction Based on Volume Shipped

Albany, N.Y.—Something new in railroad freight business is in effect on the Delaware, Lackawanna & Western Railroad. It is a deal between the railroad and the Allied Chemical Corp. whereby the railroad gives Allied a reduced freight rate according to the volume of business.

The Public Service Commission said no other railroad in the country adjusts rates according to the volume of business. Neither do truck lines, the railroads' chief competitor for freight business.

Railroads and truck lines base rates solely on a point-to-point basis or on a so-much-a-mile basis. No allowance is made for a guaranteed volume of business. The PSC spokesman said this rigidity in railroad rates had been criticized by the state and the Interstate Commerce Commission.

In a formal opinion approving the Lackawanna's proposal, Commissioner Spencer B. Eddy said some truckers had opposed the railroad's tariff. He held, however, that it was not discriminatory and not designed to divert business from a competing carrier.

The tariff covers shipments of crushed stone by the chemical company from its quarries at Jamesville, near Syracuse, to its new plant at Vestal, near Binghamton. There, the stone is processed for highway paving.

The regular rate for shipment of crushed stone between Jamesville and Vestal is $1.67 a ton. Under the new tariff, the rate is $1.52 a ton for the first 40,000 tons shipped annually, $1.47 a ton for the next 10,000 tons and $1.41 for all shipments over 50,000 tons.

The reduced rates were granted on the condition that Allied Chemical ship all its stone between the two communities on the Lackawanna line.

The PSC said the tariff could serve as a basis for similar action by other railroads to capture "total business" of shippers. Railroads have been criticized for not doing more "merchandising" in trying to get freight business, the PSC spokesman said.

R. A. Hummel

Distinguished Career Ends For R. A. Hummel, Former Chairman of Lone Star

Ragnar A. Hummel, former chairman of the board and a director of the Lone Star Cement Corporation of New York City, died last month at the age of 72 after a short illness. A native of Sweden, Mr. Hummel came to the United States in 1909, joining Lone Star in 1919. He contributed a great deal to the development of the company in both its U. S. and Latin American operations.

In 1941, Mr. Hummel became president of Lone Star, a post he retained until his election as chairman of the board in 1952. He retired as chairman at the end of 1958, but continued to serve as a director and a member of the executive committee.

During his distinguished career in the cement industry, Mr. Hummel contributed substantially to the development of the Portland Cement Association. He served as a director for many years, and as chairman of the board from 1953 to 1955.

Mr. Hummel's range of interests included the promotion of good-neighbor relations between this country and Latin America. He was also a director of Children's Village, Dobbs Ferry, N. Y., and was a director of the National Industrial Conference Board. A proud citizen of his adopted country, Mr. Hummel was vitally concerned with good citizenship, devoting much of his energies in recent years to this cause. His death marks the passing from the scene of a leader of the cement industry.

Record-High Mileage Rates Paid Stone Products Salesmen

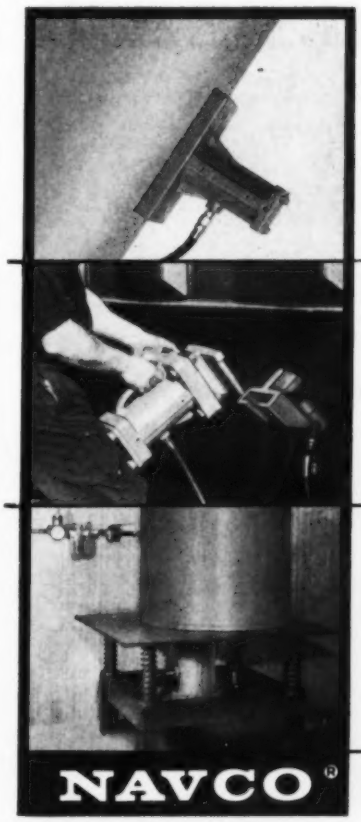
The cost of keeping a stone products salesman on the road in an automobile has reached an all-time high, according to officials of Wheels, Inc., Chicago, one of the nation's largest auto fleet leasing firms. The gain was established by reports from 327 companies operating national, regional, and local auto fleets, ranging in size from 25 to 1,000 cars.

Mileage payments to stone products industry salesmen driving their own cars on company business reached a national average of 8.82 cents per mile this year. National average for all industries is 8.91 cents, also a record high. Last year's national average was 8.22 cents per mile; in 1957 it was only 7.72 cents per mile.

For the first time, more companies paid 9 cents per mile than any other rate—36 percent. This year's jump in mileage payments is interpreted as a reflection both of increased costs and the nation's economic recovery, as companies strive to hold the salesmen they have and to add to their sales forces.

Companies who operate fleets primarily in cities, where lower mileage is the rule, are often paying 10 to 11 cents per mile, the report adds.

Dr. Joseph L. Gillson, chief geologist, E. I. du Pont de Nemours & Company, Wilmington, Del., has been named to represent the American Institute of Mining, Metallurgical, and Petroleum Engineers at the International Geological Congress in Copenhagen in 1960. Dr. Gillson is president-elect of the Institute.



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THRU BINS • HOPPERS • CHUTES
with "maintenance-free" Navco One-Piece Vibrators*

Navco Air Vibrators have a patented one-piece design for trouble-free operation. No need to stock spare parts—no assembly bolts, housing springs, separate striking plates, or grooved pistons in Navco Vibrators. For bins, hoppers, chutes, concrete forms, and batching.

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Navco "Maintenance-Free" One-Piece HCP Air Vibrators* have long piston stroke for maximum amplitude and thrust—eliminate car "clean-out" of potash, cement, and other bulk materials. Piston is the only moving part. "Free-ride" design gives continual effective vibration action. Hydraulic clamp assembly available for car not equipped with brackets.

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for Settling, Packaging, Scaling, Testing

Operator controls vibration frequency by changing the air pressure—gets required vibration for settling, packaging, shock or fatigue testing, or scale removal on castings. Complete with automatic lubricator, pressure regulator w/gage and knee, foot, or hand lever valve.

*Patented

Write for catalog specifying vibrator application

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Consumer Company's 5 cubic yard P&H Model 1500 Electric Excavator

WITH VULCAN MATERIALS COMPANY

AT CHATTANOOGA, TENN.

Chattanooga Rock Products Company's 4½ cubic yard P&H Model 1400 Electric Excavator

One P&H always sells another because

P&H "PROFIT·TONS" reduce loading costs all day...every day

Up to 30% higher bail pull for more uniform dipper speed in the pile—faster swing—exceptional physical strength of P&H welded construction—greater job availability all add up to as much as 10% more production, lower loading cost per ton and *more net profit* for owners of P&H Electric Mining Excavators.

P&H "Profit-Tons" are the end product of these *exclusive* P&H design principles:

MAGNETORQUE® . . . the most productive digging motion drive known for electric excavators. This patented P&H hoist drive electro-magnetically transmits the full digging power of an A.C. hoist motor direct to the dipper *without motor generator set conversion to D.C. current.* It gives higher bail pull, greater dipper fill factor and automatic impact protection to the digging machinery.

ELECTRONIC CONTROL . . . this patented P&H control accomplishes the quickest work motion reaction time known on electric shovels. Control maintenance expense is reduced as much as 80% by elimination of all moving parts for a completely closed circuit system.

In addition, with P&H—and only with P&H—do you get the service assurance of single source responsibility. P&H manufactures their own electrical as well as mechanical components—*designed specifically for electric excavator service.* Write Dept. 558A, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

P&H LINE:

Electric Excavators:	3½ through 10 yds.
Diesel Excavators:	½ through 3½ yds.
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Enter 28 on card, page 177

Chicago Distribution Station Near Completion for Dundee

Construction is well underway on the Chicago distribution station of the Dundee Cement Company, with completion of the facility scheduled sometime this month. It will be one of the most modern cement distribution facilities in the United States.

The two storage silos, 140 ft. high and 42 ft. in diameter, with a total storage capacity of 10,000 tons, provide a new landmark on Chicago's busy Calumet River. Truck and rail car loading will be possible at the rate of 500 t.p.h. In addition to loading bulk cement, the facility is designed with provisions for bagging operations. A 400-ft. dock, also under construction, will accommodate any boat that can navigate the Calumet River.

Growing construction needs in Chicago and the adjacent three-state area will be served by the station. Contractor is Nicholson & Company, the same firm employed in building the firm's $25,000,000 producing plant.

Work on this latter project, at Dundee, Mich., is rapidly reaching the final stages of construction and installation of machinery. Production is slated to begin this fall, with an annual output of 20,000,000 bags of cement.

A Chicago district sales office was recently opened with activities under the direction of Raymond S. Chase.

Dundee Cement Company's Chicago area distribution plant, now under construction. The photo shows slip forms used in continuous pour construction of the two 140 ft. high silos. Approximately ten days are required to complete the pour.

•

A contract has been awarded by the Dundee Cement Company to Leeds & Northrup Company, Philadelphia, covering general instrumentation for kiln control of its new $25,000,000 Dundee, Mich., cement plant.

Aerial view of the Dundee plant, which is rapidly approaching the final stages of construction and installation of machinery. Shown in the photo are the eight cement storage silos, the 40,000-sq. ft. workshop building in the rear, and the 350 ft. high smokestack. Installation of the two giant kilns and grinding mills is well advanced. Company offices, shown in the foreground of the photo, were recently made ready for occupancy.

Sand-Gravel Firms Added By American-Marietta in Materials Field Expansion

Concrete Materials & Construction Company of Cedar Rapids, Iowa, supplier of crushed stone, sand, and gravel, has been acquired by American-Marietta Company of Chicago, well-known producer of construction and building materials, including cement and concrete structural members.

The Cedar Rapids company and its associated firm, Concrete Materials Company, will be operated as an independent division of American-Marietta, with no changes in management, personnel, or facilities. Fred E. Bellamy, president, Sidney P. Moore, chairman, and K. K. Kinsey, vice-president and general manager, will continue to operate the company from division headquarters in Cedar Rapids.

Operating plants in Iowa, Kansas, and northern Missouri, the associated companies supplied more than six million tons of sand, gravel, and crushed stone in 1958 to the market. Also acquired was a division of Concrete Materials Co.—Clayton Silica Company of Clayton, Iowa, specializing in fine grades of pure silica sand produced for construction and industrial use.

Earlier this year American-Marietta entered the concrete aggregates field by acquiring the Superior Stone Company of Raleigh, N. C.

Concrete Materials & Construction Co. was founded in 1936 by the late Harry D. Bellamy, father of president Fred Bellamy, and by present-chairman Sidney P. Moore. In its latest expansion last March, the company acquired the Limestone Products quarry at Fertile, Iowa.

A survey of limestone deposits to determine both quality and quantity for existing and potential industries is under way in the state of Washington. Working with the State Department of Mines and Geology is the chemistry research section of Washington State College's Industrial Research Division. It is estimated that the survey will take two years and involve 800 samples.

Wide Range of Products with TELSMITH Equipment

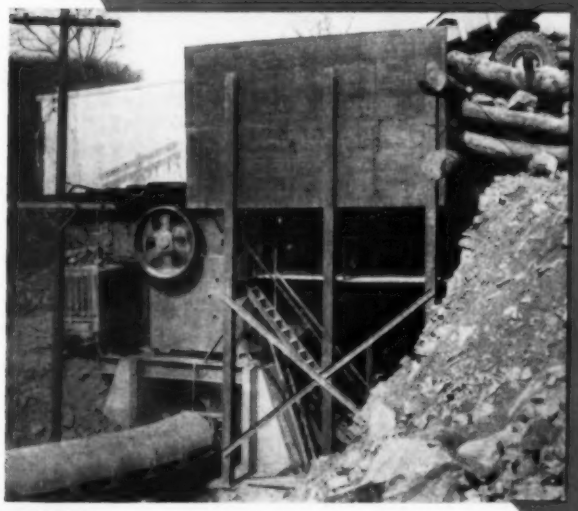
Lambert Bros.-Ralph E. Mills & Gorman, Inc. flexible crushed stone plant, Morgantown, W. Va., is producing 450-500 tons per hour of the following sizes —

for the U. S. Corps of Engineers' Sutton Dam and Hildebrand Dam: 6" x 3"; 3" x 1½"; 1½" x ¾"; ¾" x 4 mesh; and minus 4 mesh sand.

...in addition, a variety of sizes for black top plants, ready-mix concrete plants, building block plants, agricultural lime, and mine dust.

Plant was designed by Rish Equipment Company, Telsmith Distributor, Roanoke, Va., under supervision of Mr. W. S. Russell, Vice Pres.

Telsmith Equipment in this plant is listed below. Send for Bulletin 266.



▲ Telsmith 48-FC Gyrasphere Secondary Crusher

◀ Telsmith 42 x 48 Jaw Crusher and one of two Telsmith 48" Heavy Duty Apron Feeders

▼ General view of plant which has six 5' x 12' Telsmith Vibro-King Screens

Q-37

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

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Lower Open-Market Sales Causes 10 Percent Drop In 1958 Lime Production

Based on producers reports to the U. S. Bureau of Mines, lime production during 1958 dropped 10 percent from the preceding year. Total national output last year was reported as 9,200,000 short tons compared with 10,300,000 in 1957. The cutback was recorded entirely in open-market lime which dropped to 7,400,000 short tons.

Excepting construction, which increased by 8 percent, all major use categories declined as follows: agricultural, down 6 percent; chemical and industrial, down 8 percent; dead-burned dolomite or refractory lime, down 26 percent. Of the total production, quicklime comprised 60 percent, hydrate 22 percent, and dead-burned dolomite 18 percent. Over two-thirds of the total was used by chemical and industrial plants. Refractory material, construction, and agriculture accounted for 18, 13, and 2 percent, respectively.

Production came from 146 plants in 34 states (including Hawaii) and Puerto Rico. Average annual plant production was 63,000 short tons. Ohio, Missouri, and Pennsylvania, in that order, were the three leading states in which combined output represented more than 50 percent of the national total.

The average national price per ton for quick and hydrated lime combined—f.o.b. plant, and excluding container costs—also dropped from $13.17 in 1957, to $12.65 in 1958. A decrease in sales by 20 percent during the first half of 1958, compared with the same period in 1957, was offset by improved sales during the last six months.

• Engineering details have been completed for the 13-story, multimillion-dollar home office building of American Cement Company, soon to be built on Wilshire Boulevard, Los Angeles. Riverside Cement Division also will have its executive offices there. The model in this picture shows one of the two reinforced sculptured concrete screen walls (bearing walls) featured in the structure. Riverside executive offices on the fourth floor look out on a landscaped terrace. Groundbreaking ceremonies were held recently.

Ideal Stockholders Approve Acquisition of Volunteer

At the special meeting of Ideal Cement Company stockholders held recently in Denver, shares approximating 80 percent of the outstanding stock voted in favor of a plan to acquire Volunteer Portland Cement Company of Knoxville, Tenn. Subject to the plan becoming effective, Charles F. Lewis and J. Ross Hanahan Jr., presently directors of Volunteer, were elected to Ideal's board of directors.

Offering will be made by prospectus to Volunteer stockholders. It is required that holders of not less than 80 percent of Volunteer stock accept the offer before the plan can be made effective.

Combined production capacity will be about 37,000,000 bbl. annually. Ideal operates 16 plants. Volunteer operates only the one plant in Knoxville, with annual capacity at 3,000,000 bbl. Ideal sales last year approximated $92,000,000 with net earnings set at about $17,000,000. Volunteer does an annual business of about $6,500,000.

Industria de Arena, S.A., To Erect 200 T.P.H. Sand Plant

Industria de Arena, S.A., will erect a new 200-t.p.h. sand plant to meet the increasing demand for construction-quality sand for the expanding industrial and residential areas around Caracas, Venezuela.

The equipment for the new plant will be supplied by Allis-Chalmers. Included is a 30- by 18-in. Blake-type jaw crusher, a 1051 Hydrocone crusher, a 7- by 11-ft. center peripheral discharge rod mill, three vibrating screens, a solids handling pump, motors, control, and auxiliary machinery. Plant flow will be of the conventional design with twin sand classifiers which dewater the rod mill product.

Flintkote Company to Acquire Calaveras Cement Company

Calaveras Cement Company, San Francisco, will be merged into Flintkote Company of East Rutherford, N. J., under a merger agreement already approved by directors of the firms. The merger pends final approval by stockholders of both companies.

If approved, 1.7 Flintkote shares will be exchanged for each of Calaveras' 452,067 outstanding common shares, and W. W. Mein Sr., chairman of Calaveras, will become a director of Flintkote.

Calaveras owns and operates a plant at San Andreas, Calif., with a rated annual production capacity of 4,300,000 bbl. Flintkote, whose advertising slogan boasts "manufacturers of America's broadest line of building products", entered the cement industry in 1957 with the acquisition of Kosmos Portland Cement Company, Louisville, Ky. The firm also acquired Glens Falls Portland Cement Company of Glens Falls, N. Y., in June of this year.

For big power requirements

Extra lugging ability, fuel economy. Quick starts even in zero weather!

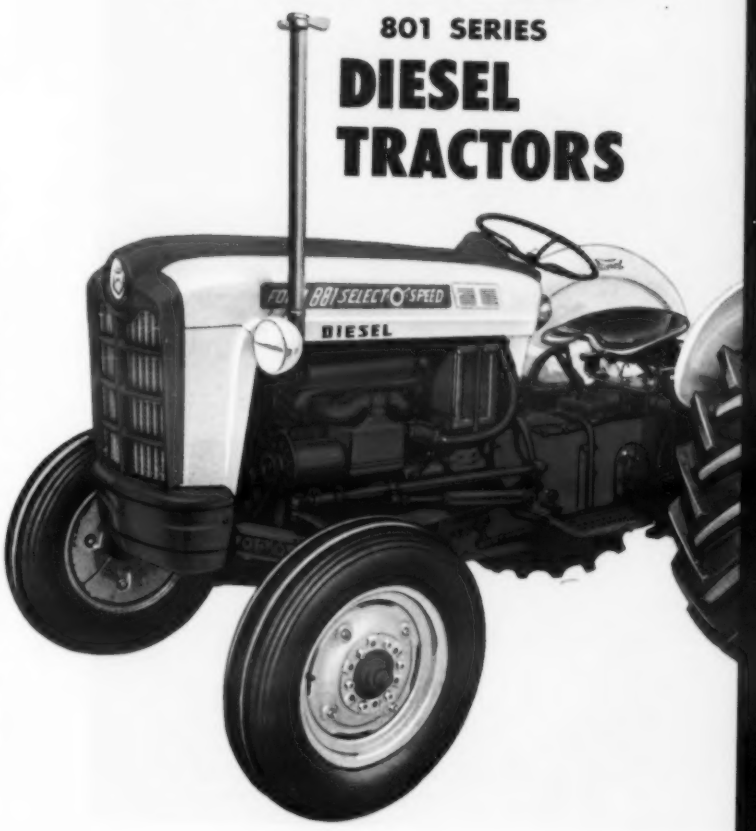
Max. corrected brake H.P. (less accessories @ 2200 rpm; manufacturer's rating)	56 H.P.
Engine displacement	172 cu. in.
Compression ratio	16.8 to 1
Number of models	7
Transmission options	4 or 10-speed "Select-O-Speed"
Heavy duty front end with industrial clutch	Optional
Available without hydraulic system and power take-off	Yes
Front tires	6.00 x 16
Rear tires	10 x 28, 11 x 28 and 12 x 28
Wheelbase at 52" front tread	74.50"
Turning radius, brake locked (w/52" min. tread)	8'11"
Overall height w/12" rear tires	57.29"
Overall length at 52" front tread	120.83"
Overall width at 52" tread	63.88"
Overall width at 76" tread	87.50"
Min. ground clearance (under transmission case)	13.98"

Factory installed options include: Power steering, power adjusted wheels, auxiliary over-under transmission which provides 12 speeds forward when used with 4-speed transmission, and new "shift-on-the-go" Select-O-Speed.

Typical working weight with front and rear tire fill, front and rear wheel weights	5617 lbs.

FORD

801 SERIES DIESEL TRACTORS



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For rock bottom original cost

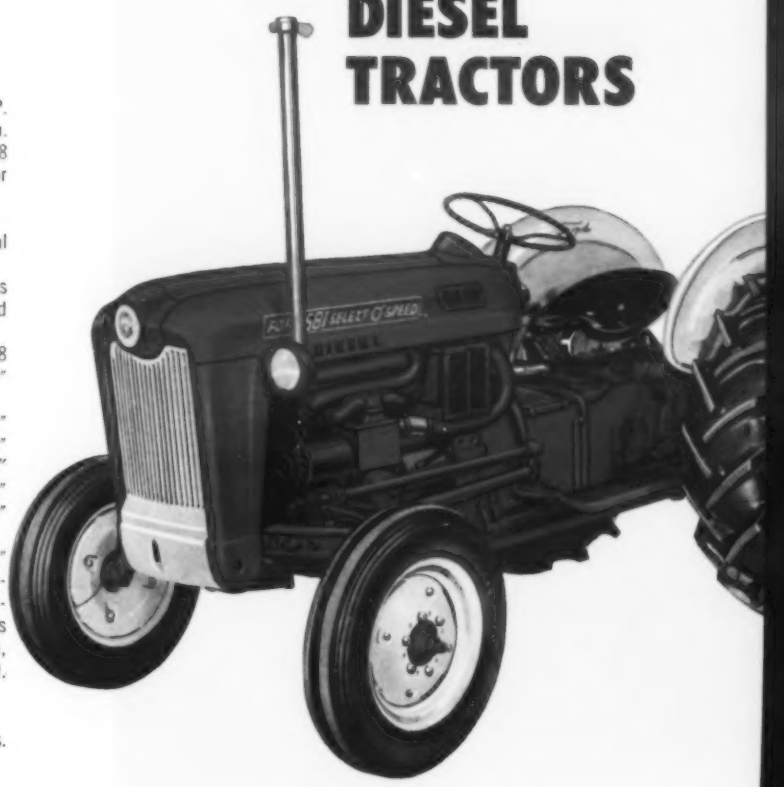
***Lowest* cost diesel tractors in their power class!**

Max. corrected brake H.P. (less accessories @ 2200 rpm; manufacturer's rating) ..... 41 H.P.
Engine displacement ..... 144 cu. in.
Number of models 8
Transmission options ..... 4 or 10-speed "Select-O-Speed"
Heavy duty front end with industrial clutch ..... Optional
Available without hydraulic system and power take-off ..... Yes
Front tires ..... 5.50 x 16 (6-ply 6.50 x 16 and 7.50 x 16 for HD front end)
Rear tires ..... 10 x 28 and 11 x 28
Wheelbase at 52" front tread ..... 74.50"
Turning radius, brake locked (w/52" min. tread) ..... 8'11"
Overall height w/11" rear tires ..... 56.15"
Overall length at 52" front tread ..... 120.83"
Overall width at 52" tread ..... 63.88"
Overall width at 76" tread ..... 87.50"
Min. ground clearance (under transmission case) ..... 13.22"
Factory installed options include: Power steering, power adjusted wheels, auxiliary over-under transmission which provides 12 speeds forward when used with 4-speed transmission, and new "shift-on-the-go" Select-O-Speed.
Typical working weight with front and rear tire fill, front and rear wheel weights ..... 4716 lbs.

FORD

601 SERIES

DIESEL TRACTORS



For economy, dependability on the big jobs

Gallon-an-hour fuel scrimper. Operates for pennies an hour, dimes a day!

Max. corrected brake H.P. (less accessories @ 1700 rpm; manufacturer's rating) ..... 54 H.P.

FORDSON

POWER MAJOR DIESELS

manufacturer's rating) ..... 54 H.P.
Engine displacement ..... 220 cu. in.
Number of models 4
Transmission ..... 6 speeds forward, 2 reverse
Available without hydraulic system ..... Yes
Front tires ..... 7.50 x 16
Rear tires ..... 12 x 38 and 14 x 30
Wheelbase ..... 80″
Turning radius, brake locked (w/58″ min. tread) ..... 12′1″
Height to top of steering wheel ..... 63″
Overall length ..... 130.5″
Overall width, maximum ..... 85″
minimum ..... 65″
Min. ground clearance (drawbar) ..... 12.75″
Factory installed options include: Power steering, raised or "live" power take-off, automatic clutch release, belt pulley and horizontal muffler.
Typical working weight with front and rear tire fill, front and rear wheel weights ..... 7361 lbs.

And for peak productivity on industrial jobs

Direct injection fuel system with automatic timing for peak power, peak savings on fuel!

Max. corrected brake H.P. (less accessories @ 2200 rpm; manufacturer's rating) ..... 56 H.P.
Engine displacement ..... 172 cu. in.
Number of models 5
Transmission options ..... 4-speed, reversing, "Select-O-Speed"
Available without hydraulic system and power take-off ..... Yes
Front tires ..... 7.50 x 16—8 ply
Rear tires ..... 12 x 28, 13 x 24, 13 x 28 and 14 x 24
Wheelbase ..... 81.5″
Turning radius, brake locked (w/54″ min. tread) ..... 9′6″
Overall height (14 x 24 rear tires) ..... 57.72″
Overall length (14 x 24 rear tires) ..... 128″
Overall width (14 x 24 rear tires) ..... 71.38″
Factory installed options include: Equipment Hydraulic Package, 28″ cast iron rear wheels (1200 lbs.), and the new "shift-on-the-go" Select-O-Speed.
Weight with 28″ tires ..... 3800 lbs.
Weight with 28″ tires and cast wheels 5000 lbs.

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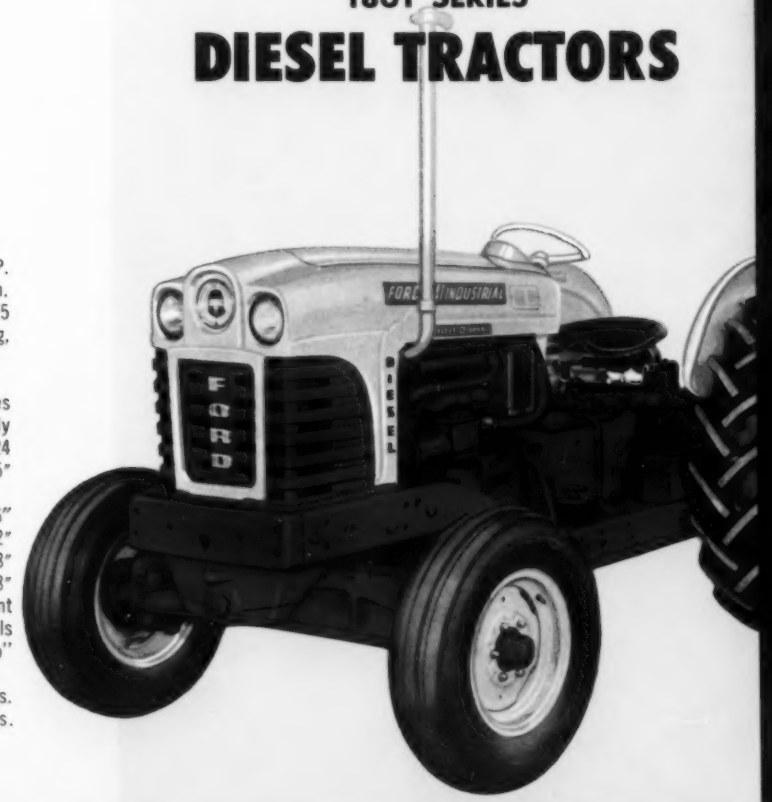
1801 SERIES

DIESEL TRACTORS



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- **For any power job**–Utility, All Purpose and Industrial tractors, gasoline or diesel.
- **For any mowing or maintenance job** – Dozens of man and money-saving implements and attachments, including many specialized tools matched to Ford.
- **For any digging job**–10 ft., 12 ft. and 14 ft. backhoes with bucket and stabilizer pad options for all kinds of digging.
- **For any loading job**–Heavy Duty, Extra Heavy Duty and Super-Duty Loaders with 1000 to 2500 lb. rated capacities.

Design, materials and or specifications are subject to change without notice and without liability.

Ford industrial tractors and equipment can help solve problems, beat schedules and save money on *your* job, too. Why not talk to your nearby Ford Tractor and Equipment Dealer about easy credit terms? Get full details on all of Ford's new industrial line for '59, on the exciting new Select-O-Speed transmission. See him today, or write Industrial Sales Department, Ford Motor Company, Birmingham, Michigan.

YOU SEE MORE
FORDS
BECAUSE THEY SAVE MORE MONEY!

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TEAR OUT FOR HANDY REFERENCE

Record Size Rotary Kiln Set in $6,500,000 Expansion Of South American Plant

The Barker cement plant of Loma Negra S.A. Compania Industrial Argentina in Buenos Aires province will incorporate an 18-ft. 6-in. by 17-ft. by 18-ft. 6-in. by 610-ft., seven-support wet process rotary kiln, said to be largest of its kind in the western hemisphere. The new kiln, to be supplied by Allis-Chalmers International, will permit a 2,000 metric-ton-per-day (about 11,700 bbl.) expansion at the South American plant.

Equipment, valued in excess of $6,500,000, being furnished the Barker plant by Allis-Chalmers International includes a 4265 Superior crusher with Hydroset mechanism; two 10- by 44-ft. wet grinding, three-compartment Compeb mills driven by 2,000-hp. synchronous motors through air clutches; and two 12- by 34-ft. Compeb mills for clinker grinding with air clutches and 2,500-hp. motor drives.

Loma Negra S.A. produces portland cement, lime, and granite aggregates, and operates two other cement plants in addition to the Barker facility. This plant and quarry began production in 1955 with a single wet process kiln rated at an annual capacity of 400,000 metric tons. The site comprises an area of 1,191 acres and includes administration buildings, warehouses, 150 houses for technical personnel and labor forces, a hotel, hospital, school, and sportsfield.

Lime-Syenite Glass Composition Holds Radioactive Wastes

Recent work done at the Atomic Energy of Canada Limited center, Chalk River, Ontario, indicates that radioactive wastes containing fission products (such as Sr^{90} and Cs^{137}) can be disposed of safely in a form of glass made from lime and nepheline syenite, according to *Chemical & Engineering News*.

The hot liquid waste (concentrated in a nitric acid solution) is added to an unheated pelletized mixture of 85 percent syenite and 15 percent lime, forming a gelled slurry. Upon heating to 1,350 deg. C., it becomes a non-leachable glassy mass. This can then be buried conveniently without any unusual precautions.

The technique is still in the testing stage, but Canadian researchers believe that it has several advantages over other methods, particularly its low cost and the few restrictions on burial location.

Juniata Silica Company Plant Begins 100 T.P.D. Operations

The Juniata Silica Company sand washing plant began operations recently near New Bloomfield, Pa. The plant is designed to produce 100-150 tons of material a day in four sizes. Sand is produced for the refractory and glass industries as well as building and highway construction.

Sufficient material is available in the area to keep the plant operating on a year 'round basis for at least 20 years. The $150,000 installation, a complete crushing, washing, and screening plant, was designed by the Eagle Crusher Company of Galion, Ohio.

Officials of Juniata include: John W. Fenyvest, president; Albert A. Mahon, vice-president; and H. L. Siebert, plant superintendent.

Delegates to mining and coal mining sessions of the 47th National Safety Congress (the annual convention of the National Safety Council to be held in Chicago, October 19-23) will hear reports on the latest safety research and developments. The Congress' 300 sessions on all forms of safety, and its 900 program participants, will attract an expected 12,500 safety men from the United States, Canada, and several foreign countries.

Wilson County Rock Products, Inc., has opened a new high production rock and agricultural limestone plant near Lebanon, Tenn. This rock crushing installation is one of the largest of its type in the Middle Tennessee area. Owners of the business are W. C. Marks, Eugene Stone, J. H. Hankins, Fred Maggart, P. T. Smith, and Willard Hagan.

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Another PLUS value...

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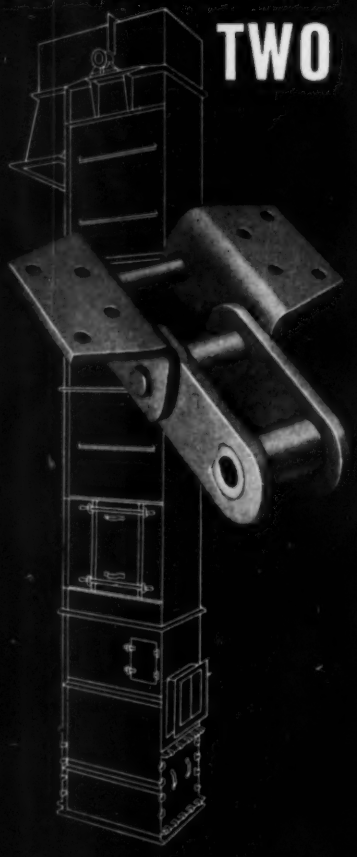

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• *Largest working bearing areas for long life* • *Accurate size control and fits for maximum fatigue resistance* • *Precision-made chain parts for smooth sprocket action... less wear on chain and sprockets.*

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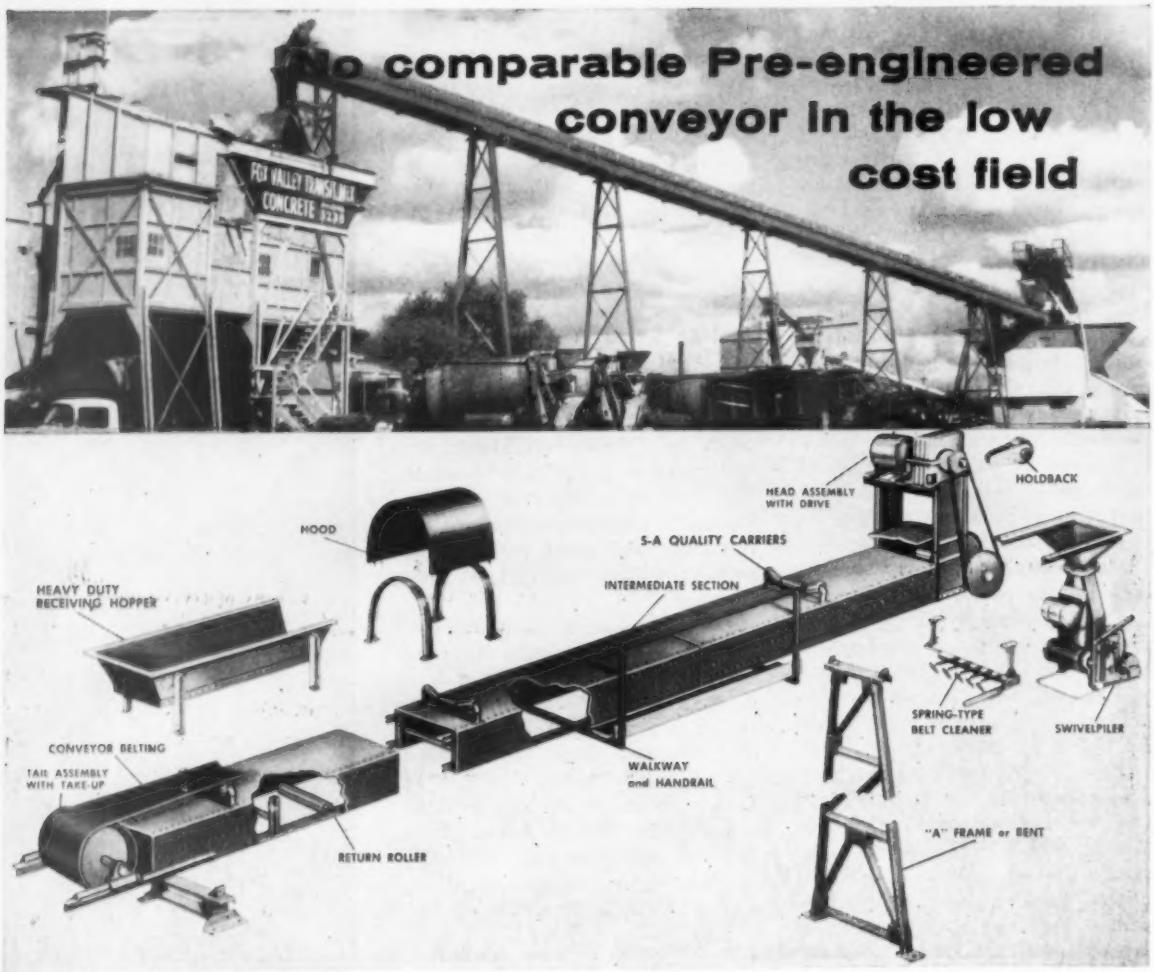

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Here's a "do it yourself" conveyor that not only provides for fast, simple on-the-job erection but combines quality conveyor components and features provided in no other pre-engineered conveyor. Exclusive Bent Plate Decking assures easy erection or alteration and provides protection for return run of belt. Four high-strength bolts fasten head assembly . . . eight bolts join intermediate sections . . . and six bolts connect tail assembly — for simplest installation ever. Check features at right.

- S-A CURVE CROWN® Pulleys — Revolutionary new crown provides greater belt training effect while minimizing belt stretch and wear. New SQUEEZELOCK® Hub provides full gripping power — eliminates keyways.
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AVAILABLE IN 18", 20", 24", 30" and 36" WIDTH CONVEYORS—DELIVERED FROM STOCK.

WRITE FOR BULLETIN 458

S-A

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PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
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Kaiser Gypsum Schedules Multimillion-Dollar Plant For New Mexico Site

Kaiser Gypsum Company, Inc., Oakland, Calif., will build a multimillion-dollar gypsum products plant near Albuquerque, N. M. The plant will begin production in June, 1960, with a rated capacity of 120,000,000 sq. ft. of gypsum board annually.

The plant will be located adjacent to a high-grade deposit of gypsum at Rosario, between Albuquerque and Santa Fe. The property is being acquired from the Indian Development Company, a New Mexico corporation. Indicated reserves of gypsum are sufficient for many years of operation. The ore is described as being chemically suitable for all other commercial and industrial uses, in addition to gypsum building products.

The 94-acre site is flanked by the main Santa Fe Railroad line and will be served by a rail spur. In full operation, the plant should be capable of loading out more than 220 large-sized flatcars of gypsum board products each month.

Kaiser Engineers Division of Henry J. Kaiser Company will engineer, design, and supervise construction of the project.

In addition to the Rosario plant, the company will form a new sales division, with headquarters in Albuquerque. The company presently has a limited force of salesmen located in various southwest centers, operating out of the Southern Division, which has its main office at Long Beach, Calif.

Production, Shipments Drop For Canadian Portland Cement

Canadian manufacturers of portland cement shipped or used 781,363 tons of cement in June, 1959, compared with 651,788 tons in the previous month, according to the Dominion Bureau of Statistics, Canada. In 1958, the June shipments amounted to 719,926 tons.

Actual production for June, 1959, was 677,762 tons compared with 686,378 tons in the corresponding month of 1958. Production for the first six months of 1959 totals 2,650,719 short tons, compared with 2,784,429 for the same period in 1958. Total shipments for the six-month period amount to 2,568,083 short tons, as contrasted with 2,521,478 for the same period in 1958.

May Open Market Lime Sales Continue Upward Trend

Domestic sales of open-market lime in May (853,513 short tons) increased from the previous month's output, according to reports by producers to the U. S. Bureau of Mines. Refractory lime increased whereas a decrease was noted in agricultural, construction, and chemical and other industrial lime. (Note chart below.)

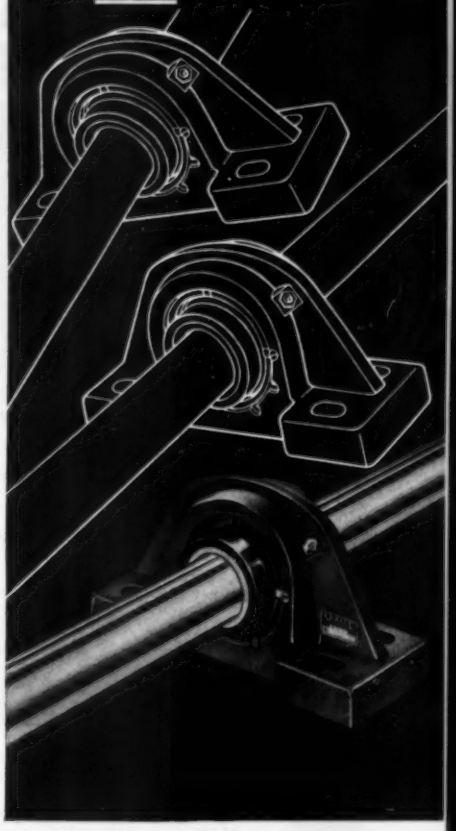
Lime Sold by Producers[1] in the United States, in Specified Periods of 1958-59, by Types and Major Uses in Short Tons

	April 1959	May 1959	May 1958	January-May 1959	January-May 1958
By types:					
Quicklime	661,197	673,160	456,247	3,153,807	2,240,655
Hydrated lime	187,400	180,353	163,347	811,929	745,901
Total	848,597	853,513	619,594	3,965,736	2,986,556
By uses:					
Agricultural:					
Quicklime	9,993	8,789	5,529	33,194	19,833
Hydrated lime	19,737	14,904	15,181	61,793	62,718
Total	29,730	23,693	20,710	94,987	82,551
Construction:					
Quicklime	14,684	13,153	11,855	62,177	51,085
Hydrated lime	87,794	88,765	80,278	368,167	351,799
Total	102,478	101,918	92,133	430,344	402,884
Chemical and other industrial:					
Quicklime	444,033	424,395	319,688	2,028,068	1,581,884
Hydrated lime	79,869	76,684	67,888	381,969	331,384
Total	523,902	501,079	387,576	2,410,037	1,913,268
Refractory (dead-burned dolomite)	192,487	226,823	119,175	1,030,368	587,853

[1] Also includes a small quantity of captive tonnage. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

Another PLUS value...

STAMINA AT ANY ANGLE



Under loads or shocks from any angle, whether radial, thrust or combined loads, Shafer Self-Aligning Roller Bearings always retain their high load capacity. Add misalignment and the load still remains safely on the roller centers reducing retainer wear, increasing bearing life. Why? Shafer CONCAVE roller and true sphere race design—proved longer lived in thousands of installations. See your nearby distributor or mail coupon.

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Announcing **WORLD'S TOUGHEST OFF-ROAD TIRE!**

All-New Nylon U. S. Royal Super Con-Trak-Tor with ...69% to 95% Longer Tire Life!

S.R.T.*

Steel Reinforced Tread*

New S.R.T.—as shown here in the X-Ray photo—is a **tough** reinforcement of tread, shoulder and buttress areas. It consists of several thick layers of tread rubber containing thousands of short lengths of brass-coated steel filaments. This forms a virtually **impenetrable** mat between the tread and nylon cord body and extends down through the shoulder and buttress areas providing **positive** protection against combination cut-and-impact failures!

Add to exclusive Steel Reinforced Tread ... 50% deeper tread at center ... far deeper tread at shoulder ... 25% more ground contact ... Double-Strength Nylon and you have the world's **toughest** off-road tire! No wonder the great new U. S. Royal Super Con-Trak-Tor-S.R.T. outperformed **every** tire put against it—by the widest of margins—up to 95%! Can you afford less on **your** jobs?

U.S. ROYAL SAFETY 1ST **TRUCK TIRES**

US RUBBER **United States Rubber**

● Employees at the Millville Quarry of Jones & Laughlin Steel Corporation's Blair Limestone Division, Martinsburg, W. Va., have worked almost five and one-half years without a disabling injury. The record, begun on January 28, 1954, now extends for more than 2,000 days and more than 700,000 manhours. Jack Cameron, Millville quarry superintendent, is shown here with a recently-acquired certificate of honor awarded by the Joseph A. Holmes Safety Association for five years of accident-free operations. Other safety award certificates on the wall are from the U. S. Bureau of Mines, National Lime Association, the Holmes Association, and J&L.

Construction Put in Place Hits $5.2 Billion in July, 15% Ahead of Last Year

The value of new construction put in place in July is up seasonally to $5,200,000,000, according to preliminary estimates of the U. S. Department of Commerce. This is an increase of 3 percent over June and 14 percent over July, 1958. The total value of work put in place in the first 7 months of 1959 is $30-100,000,000—15 per cent ahead of the same period in 1958.

The physical volume of new construction put in place during the first 6 months of 1959 is estimated to be 13 percent above the volume for the corresponding 1958 period.

Outlays for new private construction are up seasonally in July to $3,600,000,000 and total $21,200,-000,000 for the first 7 months of 1959—16 percent higher than in the first 7 months of 1958. New residential construction, which shows no appreciable seasonal change in July, accounts for the 1959 increase in private construction with a 32 percent expansion over the first 7 months of 1958—from $9,300,000,-000 to $12,300,000,000. Expenditures for nearly all other major types of private construction show greater than seasonal increases in July.

Expenditures for public construction show a normal rise in July to $1,600,000,000. For the first 7 months of 1959, the value of work put in place is $9,000,000,000—12 percent above the same period in 1958. The increase results chiefly from accelerated expenditures for highways, military facilities and public residential building.

A capsule course in human relations appeared in the June, 1959, issue of *Kaiser Builder*, monthly publication of Kaiser Engineers. It consisted of the following telling points:

Five most important words—I am proud of you.

Four most important words—What is your opinion?

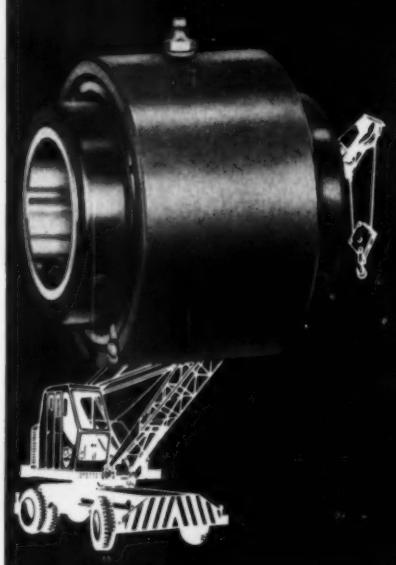
Three most important words—If you please.

Two most important words—Thank you.

Least important word—I.

Another PLUS value...

BUILT TO TAKE IT... EASY



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Here's why Shafer Bearings add extra stamina and life to heavy-duty equipment. Combining the low rolling friction of a ball with the high load-carrying capacity of a roller, they roll easily, yet take more of the most punishing loads and shocks. Shafer Bearings take radial, thrust or combined loads and misalignment without binding, without loss of load capacity. See your distributor or write for latest catalog.

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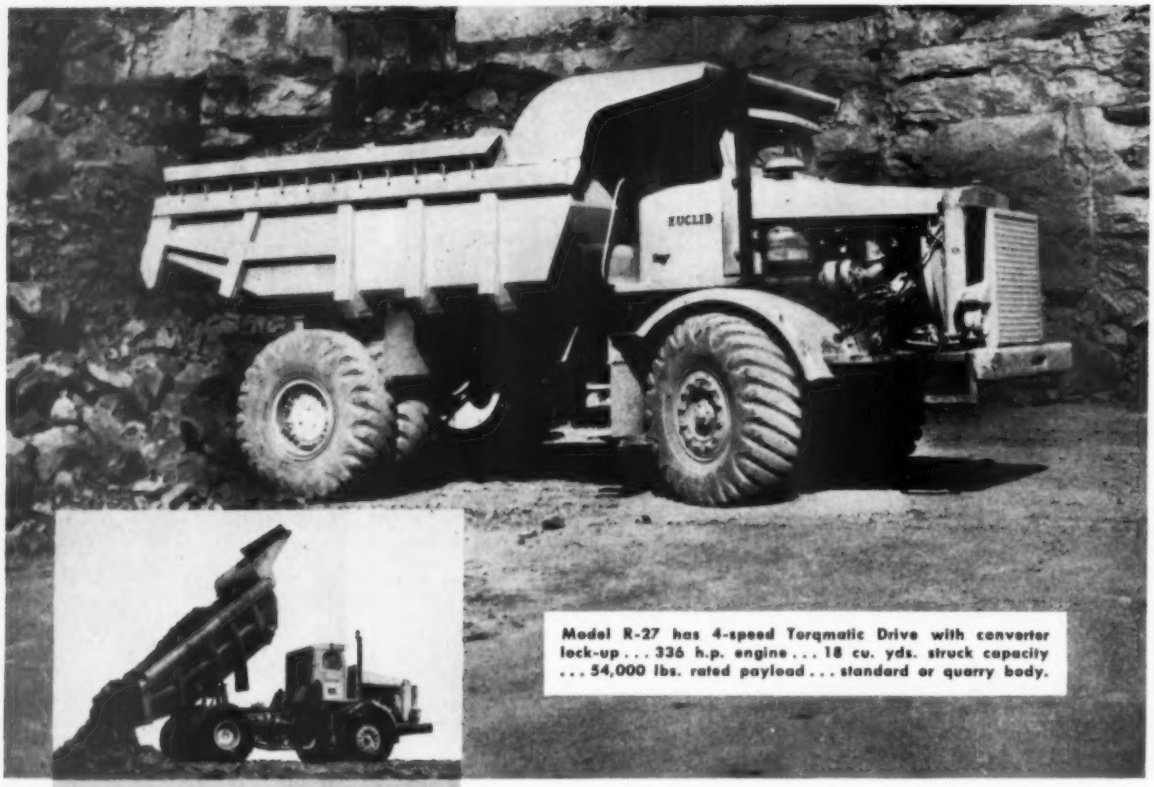

Model R-27 has 4-speed Torqmatic Drive with converter lock-up . . . 336 h.p. engine . . . 18 cu. yds. struck capacity . . . 54,000 lbs. rated payload . . . standard or quarry body.

Rock Bottom Hauling Costs with Euclid Rear-Dumps

THE simple but rugged design of Rear-Dump "Eucs" has provided cost cutting performance in mines and quarries for over 25 years. This unmatched experience in building dependable off-highway haulers, combined with continuous product improvement and excellent dealer facilities for parts and service, results in high job availability and low maintenance cost.

Euclid's line of rear-dump haulers for mine, quarry and construction work is the most complete in the industry. With standard or quarry bodies, there are models with 10, 15, 18, 22, 27, 40 and 55 ton payload capacities . . . engines from 128 to 670 total h.p. . . . 5 and 10-speed transmissions and Torqmatic Drives. For close quarter work there are three over-hung engine models with semi-trailers of 12, 22 and 35 ton capacities.

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Uneven Gains, Losses In All Types of Cement Produced in U.S. in 1958

Three classes of hydraulic cements were produced by the cement industry in the United States and Puerto Rico during 1958—portland, natural, and slag—as reported to the U. S. Bureau of Mines. In addition, prepared masonry cements were produced at many portland cement plants and at the natural and slag cement plants.

Production of portland cement was 4 percent greater in 1958 than in 1957, increasing to 311,000,000 bbl.

Production of prepared masonry cement was slightly less in 1958 (14,400,000 bbl.) than in 1957 (14,700,000 bbl.), continuing the decrease noted in 1956.

Production of natural and slag cements decreased from 631,000 bbl. in 1957 to 520,000 bbl. in 1958.

Shipments of portland cement increased to 307,000,000 bbl. valued at $998,000,000 with an average value of $3.25 per barrel, an increase of seven cents.

Shipments of prepared masonry cement were nearly the same in 1958 as in 1957—14,000,000 bbl. valued at $55,000,000 with an average value of $3.77 per barrel, a drop of four cents.

Shipments of natural and slag cements decreased to 500,000 bbl. valued at $1,600,000 with an average value of $3.32, an increase of 26 cents.

All sections of the United States except the northeastern states section showed increases in consumption over 1957, resuming the upward trends held since 1945.

The estimated annual capacity of all portland-cement plants on December 31, 1958, was 6 percent greater than on December 31, 1957. The increase of 22,000,000 bbl. was due to expansion at 20 of the 163 plants in operation in 1957 and the addition of 4 new plants in 1958.

Less coal and oil were consumed for fuel during 1958, while the cu. ft. of natural gas consumed increased 13 percent compared with 1957.

A breakdown of the total production of portland cement shows that general-purpose and moderate-heat portland cement (types I-II) constituted 94 percent of the total. Less high-early-strength portland cement (type III) was made than in 1957 though 9 more plants produced this type. No portland-pozzolan cement was produced. Ten plants reported production of portland-slag cement, with 94 percent of the 4,000,000-bbl. output produced at 4 plants.

Natural cement was produced at three plants and slag cement at two, the same as in 1957. These five plants and two others—a natural cement and a hydraulic lime cement plant—produced prepared masonry cements in 1958.

Victorville Lime Rock Company Plans $1,000,000 Calif. Mill

Construction of a $1,000,000 mill in the Lucerne Valley of California is planned by the Victorville Lime Rock Company, Victorville, Calif. The mill is expected to be in operation in the spring of 1960. Further expansion of the company's activities in this area includes the conversion of the Victorville plant to processing other nonmetallic minerals when the present limestone quarry deposit is depleted within the next three years.

Preliminary work has already been started on the new 600-acre lime rock quarry in Furnace Canyon, on the northern slopes of the San Bernardino mountains. The company has 1,600 acres at Furnace Canyon, including plant site, and has been developing the area over the last three years.

The company is the largest exclusive limestone producer in California, and one of the biggest west of the Mississippi River.

Domestic producers of fuller's earth reported drops of 2 percent in production and 6 percent in value for 1958. Florida furnished 59 percent of the total U. S. production, Georgia 23 percent, and Tennessee 8 percent. Absorbent uses accounted for 148,000 tons, 41 percent of total consumption. Insecticides, drilling muds, and mineral-oil refining were the other major uses.

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Another PLUS value..

SEALS IN LONGER LIFE

When you choose a Shafer Bearing, you may be sure it has the *right* seal for *longest life* in your *specific* application.

Whatever the operating condition—whether it's fine abrasive dust from vibrating screens or caustic solutions from industrial washers—the *right* Shafer self-aligning seal is available to assure full bearing protection. Shafer has the industry's largest selection. Call your distributor or mail the coupon.

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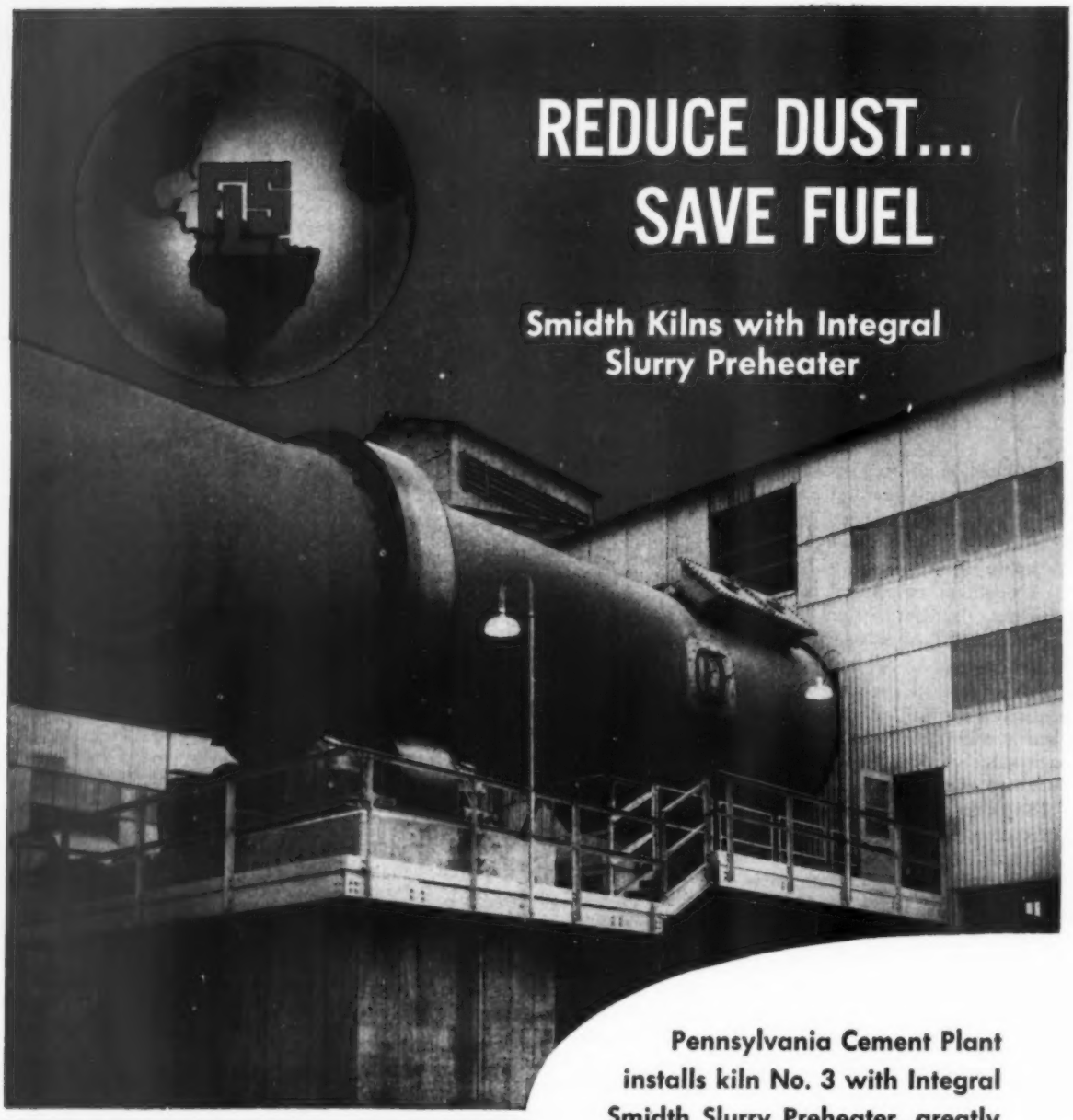

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Marsh, Rhoades Named To Top Executive Posts In Kaiser Industrial Group

Important changes in the top management structure of four principal companies in the Kaiser industrial group have resulted as Henry J. Kaiser Sr. assumed the new position of founder-chairman of each organization. He formerly was chairman of the board and president of Kaiser Aluminum & Chemical Corporation, Permanente Cement Company, and Kaiser Steel Corporation, and chairman of the board of Willys Motors, Incorporated. He remains chairman of the board of the parent firm, Kaiser Industries Corporation.

The boards of directors of the companies have elected the following officers: W. A. Marsh, president and chief executive officer of Permanente; D. A. Rhoades, president and chief executive officer of Kaiser Aluminum & Chemical; J. L. Ashby, president and chief executive officer, Kaiser Steel; and S. A. Girard, president and chief executive officer, Willys Motors. Each of these men formerly served as vice-president and general manager of their respective organizations.

Mr. Marsh joined the Henry J. Kaiser Company in 1937 as a sand and gravel salesman. He has served as manager of operations and sales for Permanente Cement, and was named vice-president and general manager of Permanente and its subsidiaries in 1951.

W. A. Marsh

Mr. Rhoades is a veteran of 32 years with various Kaiser companies, beginning in operations and sales with the Sand and Gravel Division of the Kaiser Paving Company. In 1946 he was named vice-president and general manager of Kaiser Aluminum & Chemical.

D. A. Rhoades

Domestic Ball Clay Production Drops by 3 Percent in 1958

Domestic output of ball clay in 1958 decreased 3 percent in tonnage, but less than 1 percent in value, compared with 1957, according to reports from producers to the U. S. Bureau of Mines. Since 1943, Tennessee has been the largest producing state with 64 percent of the U. S. total, the same as in 1957.

The pottery industry consumed 54 percent of ball clay produced in 1958, compared with 60 percent in 1957, 63 percent in 1956, and 67 percent in 1955 and 1954. Other consumption figures for 1958 were: floor and wall tile, 24 percent (up 18 percent), and refractories 13 percent (up 4 percent). Ball clay used in making whiteware, the major use, decreased 5 percent. In 1958, the average value per short ton for ball clay as reported by producers was $13.86 compared with $13.52 in 1957 and $12.70 in 1954.

Another PLUS value...

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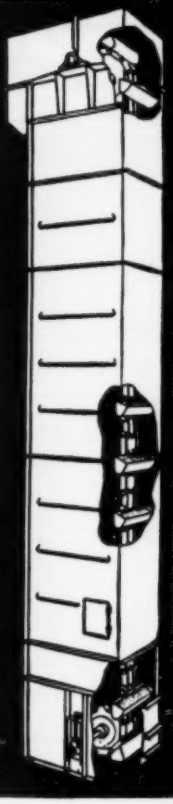

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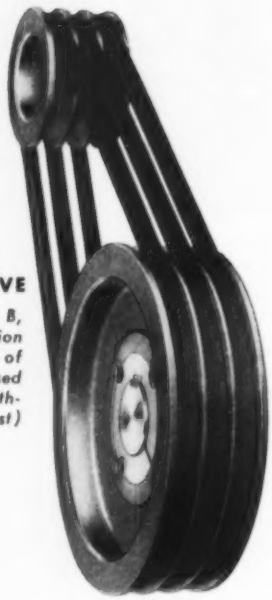

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DYNA-V TAPER-LOCK DRIVE

NEW *HIGH CAPACITY*

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COMPARISON, ILLUSTRATED ABOVE — 3 HP, 1750 RPM, 2.41 TO 1 RATIO

	BELTS		SHEAVES			CENTER DISTANCE	HP	WEIGHT (LBS.)	COST	
	Number	Size	O.D. Driver	O.D. Driven	Width				Per hp	Per Drive
CONVENTIONAL TAPER-LOCK DRIVE	3	A42	4.15"	8.95"	2½"	12.3"	4.62	24.7	$5.62	$25.98
DYNA-V TAPER-LOCK DRIVE	2	3V400	3.35"	8.00"	1$\frac{3}{32}$"	10.8"	5.0	18.0	$4.50	$22.50
% SAVING *Savings vary with different sized drives*			**19%**	**10%**	**56%**	**12%**	+	**27%**	**19.9%**	**13.4%**

Dyna-V Drives are sensationally compact. They are capable of handling up to three times as much horsepower in a given space. Dyna-V opens vast new possibilities for better, more economical machine design. And, in most instances, *Dyna-V costs less!*

Narrower grooves, to match stronger, narrower Dyna-V Belts, greatly reduce the face width and the weight of Dyna-V Sheaves. Cost is lowered. Smaller diameter sheaves and shorter center distances multiply savings.

Dyna-V Sheaves decrease shaft overhang—increase bearing life. The new dimensional stability of Dyna-V Belts solves the problem of belt matching. Every belt carries its full share of the load.

Dyna-V Drives are available for capacities from 1 to 1500 hp. Ask your Dodge Distributor. Or write us for new Dyna-V Bulletin.

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of Mishawaka, Ind.

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Wage, Fringe Benefit Boosts Given by Industry Contracts

New contracts have been signed between various nonmetallic minerals industry manufacturers and locals of the Cement, Lime and Gypsum Workers International Union, generally following the contract patterns established earlier by the Ideal Cement Company contracts.

Main avowed aim of the union in the settling of this year's contracts was a basic settlement to serve as a pattern settlement for each plant in order to produce uniform contract terms, eliminating geographical differentials. The exact degree of success is indicated by the National Gypsum Company contracts.

At the York, Pa., plant, workers ended a five-weeks strike, accepting the company offer of 24-cent an hour wage boosts calling for an 8-cent increase each year of the three year contract. At the Shoals, Ind., plant, a three-day strike ended when a new contract was signed calling for wage increases of 19-20 cents an hour over the next two years.

In general, the pattern calls for an 8-12 cents an hour boost retroactive to May 1, with a second 10-cent boost next May 1. Fringe-type benefits increase the cost of the "package"; increased medical coverage, with the company paying 65 percent of the insurance cost; a supplemental unemployment benefit plant; less-rigid vacation-elegibility requirements, which permit employees with 12 years of service a three-week vacation effective January 1, 1960, and effective January 1, 1961, three-weeks vacation for employees with 10-years' service; plus Sunday pay varying from time-and-three-tenths, to time-and-one-quarter.

Variations exist due to individual local problems. The pay scale range now varies in many areas from $1.96 to $2.87, with a peak of $2.97 due in 1960.

New York City Truck Drivers Get 37½¢ Hourly Pay Boost

A three-week strike of 1,250 drivers of concrete, sand and gravel trucks in the metropolitan New York City area ended late in July with an increased wage scale that makes the truckers "the highest paid construction teamsters in the U.S."

Work on $250,000,000 in metropolitan area construction and highway projects was halted, and about 100,000 building craftsmen were idled while agreements were reached with International Brotherhood of Teamsters local. The pact gives the drivers a 37½-cent hourly wage boost, bringing their average hourly pay up to $3.50. The raise means that drivers will earn $140 for 40 hours work instead of $125 called for by the contract that expired.

In addition to the wage boosts, 3 cents an hour will be added to the pension fund, and another 2 cents an hour to the health and welfare fund. Employers will pay time-and-one-half for work time prior to 8 A.M. while men wait for job assignments.

● Fred P. Curtis (center), president of the Lyman-Richey Sand and Gravel Corporation, Omaha, Nebr., received an unexpected award at the program celebrating the firm's 75th anniversary earlier this year. Making the presentation are A. P. Jones (left), general superintendent, and H. A. Koop, safety director.

Another PLUS value...

HOLES MAKE IT HOLD MORE

Here's the answer to increased bucket capacity in your elevators: *Rex Style AC Buckets.* Unique air ports in the bottom act as a relief valve for faster loading and unloading...prevent entrapped air from restricting capacity. Closer spacing of buckets assures increased over-all elevator capacity. Style AC buckets are ideal for handling of light, fluffy materials. For all the facts, see your Rex Distributor or mail the coupon.

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First-Half Reports from Many Nonmetals Firms Mean Money in the Bank

As the news columns in the newspapers and in PIT AND QUARRY have indicated, business has pulled out and away from the recession. First-half reports for 1959, with increases in sales and earnings ranging from modest to substantial, show the nonmetallic minerals industry keeping pace with other industries in the recovery.

The second quarter was generally better than the first. Most firms expect a good third quarter, with a backlog of orders already in their hands.

Reports from various firms in the nonmetallic minerals industry, for the first half of 1959, compared with the same period in 1958:

Basic Incorporated marked the best period in its history as net sales jumped 73 percent, from $8,466,724 to $14,653,779. Net earnings (after taxes) skyrocketed more than 5,600 percent, from $25,902 (which reflected the low operating rate of the steel industry at the time) to $1,489,690. Earnings equal $1.81 per common share; none paid in 1958 period.

Consolidated Rock Products Company reported net income of $706,579, up 62 percent from $436,115 in the same period last year. Sales climbed to $13,942,806, up 23 percent from $11,318,897. (Saticoy Rock Company, recently merged with Consolidated, accounted for $1,828,248 of the sales gain, and $57,945 of the higher profit.) Earnings equal 76 cent per share, up 28 cents.

National Gypsum Company reported record sales and earnings for the period this year. Sales jumped 44 percent from 1958 first-half sales of $73,940,317 to a record $106,305,515. Earnings jumped 104 percent, up from $6,013,119 to $12,253,015. (Figures include consolidation of figures for Huron Portland Cement Company and Olean Tile Company.) Earnings equal $2.23 per share, up 89 cents.

Pacific Cement and Aggregates, Incorporated, reported net income soared to $439,889, up 627 percent from $60,492. Sales for the first six months were up 30 percent, at $13,827,892 from $10,676,214.

Pennsylvania Glass Sand Corporation and subsidiaries reported net income (after taxes) at $1,384,492, up 34 percent from $1,036,538 in the first half of 1958. Earnings equal $1.63, up 33 cents.

United States Gypsum Company set records in sales and earnings during the first half, with net income of $22,861,188 on sales of $145,127,278. Compared with the similar period in 1957, sales have increased 19 percent from $122,585,485, and profits have increased 32 percent from $17,324,175. Earnings equal $2.82 per share, up 69 cents.

Reports from several cement manufacturers for the first half of 1959, compared with the same period in 1958:

General Portland Cement Company totalled net sales of $19,328,200 and net profits (after taxes) of $3,851,600 compared with last year's first-half sales of $15,229,600 and net profits of $3,222,000—increases of 26 and 19 percent respectively. Earnings equal $1.14 a share, up 27 cents. Statements for both years have been restated to reflect the operations of Consolidated Cement Corporation, merged into General in April.

Lone Star Cement Corporation and consolidated subsidiaries report sales of $50,740,721 and net income (before taxes) of $13,880,217 compared with the 1958 period's sales of $43,755,701 and net income of $9,346,436—increases of 16 and 48 percent respectively. Earnings (after taxes) equal $1.10, up 31 cents.

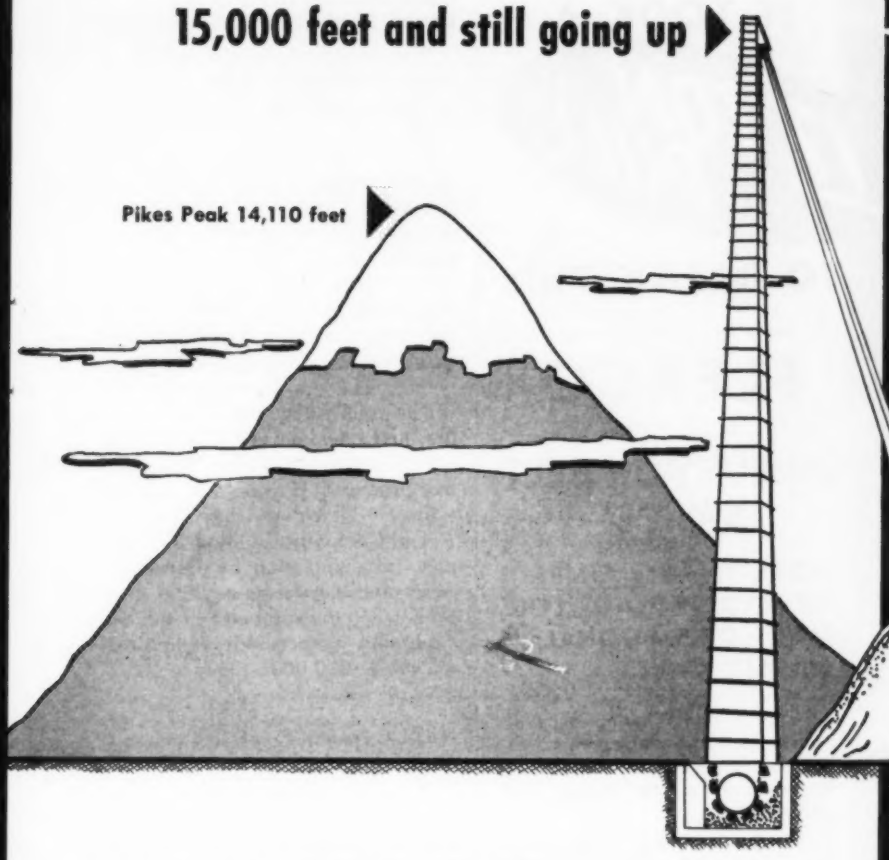
Permanente Cement Company enjoyed record sales and earnings during the period. Sales of $37,446,000 were up 34 percent from the corresponding 1958 figure of $27,937,000. Net earnings (after taxes) of $5,312,000 were up 47 percent, compared with $3,624,000 in 1958. (Sales from newly-acquired Olympic Portland Cement Division and the new Portland Division of Glacier Sand and Gravel Company are incorporated in first-half figures.) Earnings equal 93 cents per share, up 30 cents.

Enter 48 on card, page 177

Enter 49 on card, page 177 →

Another PLUS value...

15,000 feet and still going up



REX CEMENT MILL BUCKET ELEVATORS

Higher than Pikes Peak... that's the total footage of Rex Cement Mill Elevators which have been installed in the past five years. Here's proof of the cost-saving, profit-adding advantages of this advanced concept in elevator design.

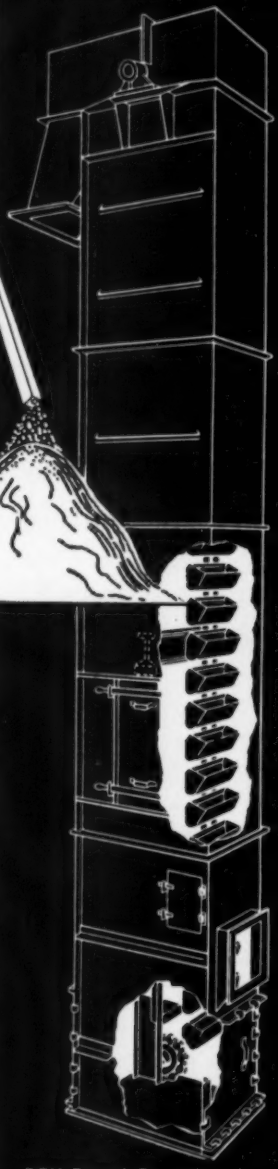
Five years ago CHAIN Belt introduced this completely new idea in cement mill elevators... a concept based on the needs of modern cement mill operations. It was radical... the first really new idea in bucket elevators in 20 years. Each component was individually designed and balanced with the strength of the others. The results: increased capacity... longer life... freedom from premature breakdowns... economy.

Today more than 15,000 feet of these new elevators are working in cement mills all over the world... and the total increases daily. The new concept is so sound... so basically right... it has become a standard that others are still seeking to reach. For complete data on Rex Cement Mill Bucket Elevators or Elevator Components, write for Bulletin No. 3304. CHAIN Belt Company, 4604 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto.

REX®

CEMENT MILL BUCKET ELEVATORS

Rated For RIGHT Selection



REX Rated Centrifugal Discharge Bucket Elevator

Bulletin No. 3304 gives you complete information on Rex Cement Mill Bucket Elevators—includes tables for fast, easy selection.

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Plates have special cupped ends on top and bottom . . . distribute the strain over entire plate area.

Teeth are spaced for best holding action.

Precision-made bolts and nuts.

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Cooksville-Laprairie Brick Begins $1,000,000 Expansion

The proposed construction of a Haydite lightweight aggregate plant has been announced for Cooksville-Laprairie Brick Limited, Montreal, Canada. The company, a division of Dominion Tar and Chemical Company Limited, is planning the new facilities adjacent to its brick plant at Delson, Que.

A 50 percent increase in production capacity is also scheduled at the firm's Cooksville, Ont., expanded-shale lightweight aggregate plant. The Cooksville expansion will feature a new crushing, screening, and blending plant to produce various aggregate grades. This plant has produced Haydite for over 30 years.

The Cooksville addition is scheduled for completion by December, 1959, and the Delson addition some time in 1960. Total cost of the two expansion projects will be approximately $1,000,000.

Natl. Gypsum Plant Expansion To Up Shoals Capacity 50%

A major expansion program was recently begun at the National Gypsum Company plant near Shoals, Ind. The project expansion, which is expected to be completed by next February, will boost the plant's capacity by 50 percent. All plant operations will be enlarged, and operations in the gypsum mine (500 ft. below the plant) will be increased to provide more ore.

Products of the Shoals plant include wallboard, lath, plaster, sheathing, and other gypsum building products. This facility serves dealers in Tennessee, Kentucky, and parts of Ohio, Indiana, Georgia, Alabama, Arkansas, Missouri, Illinois, and West Virginia. It has been operating close to capacity since it was completed in 1955.

A $250,000 quarry plant is being erected at the sand plant of Alliance Sand Company in Palmerton, Pa., replacing the old quarry located along Hazard Road. The new facilities combine quarry, loading and shipping operations, and company headquarters. Construction is expected to be completed by fall.

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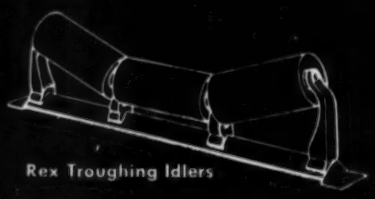
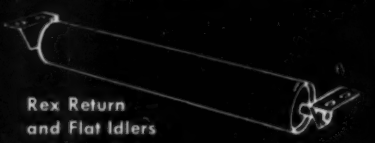
REX® Conveyor components

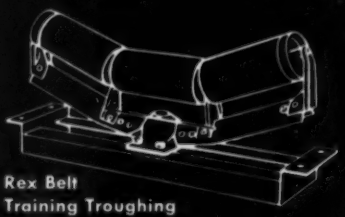
Complete line of idlers and pulleys Rex-Rated for every type of service



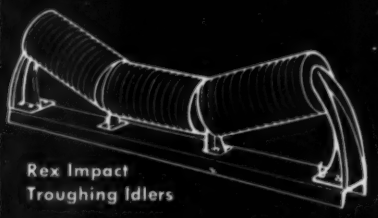
Rex Troughing Idlers



Rex Return and Flat Idlers

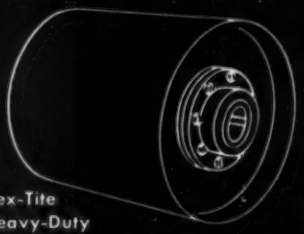


Rex Belt Training Troughing Idlers



Rex Impact Troughing Idlers

Rex Spiral Return Idlers



Rex-Tite Heavy-Duty Conveyor Pulleys

Rex Taper-Lock Normal-Duty Conveyor Pulleys

CALL THE MAN WHO

makes your conveyor dollar carry more, last longer

Here's how you can be sure of top conveyor efficiency and economy: include a CHAIN Belt Conveying Engineer on your planning team. He's well qualified in two ways to help your team find the right system for your specific needs: 1. He offers you the industry's most complete selection of belt conveyor components such as idlers, pulleys, bearings and take-ups—assuring the most efficient design for every application. 2. He's an application expert—offering you many years of experience in selecting the right conveyor system for the job.

As a result, you get top efficiency in your system and you save because you cut initial, operating and maintenance costs. You keep down time to a minimum with trouble-free operation and longer conveyor life. You move maximum tons at lowest cost.

Whether you are planning a new system or expanding existing units, call in your CHAIN Belt Conveying Engineer. He will help your planning team get better results. Contact your nearest CHAIN Belt District Office. Or write CHAIN Belt Company, 4604 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto.

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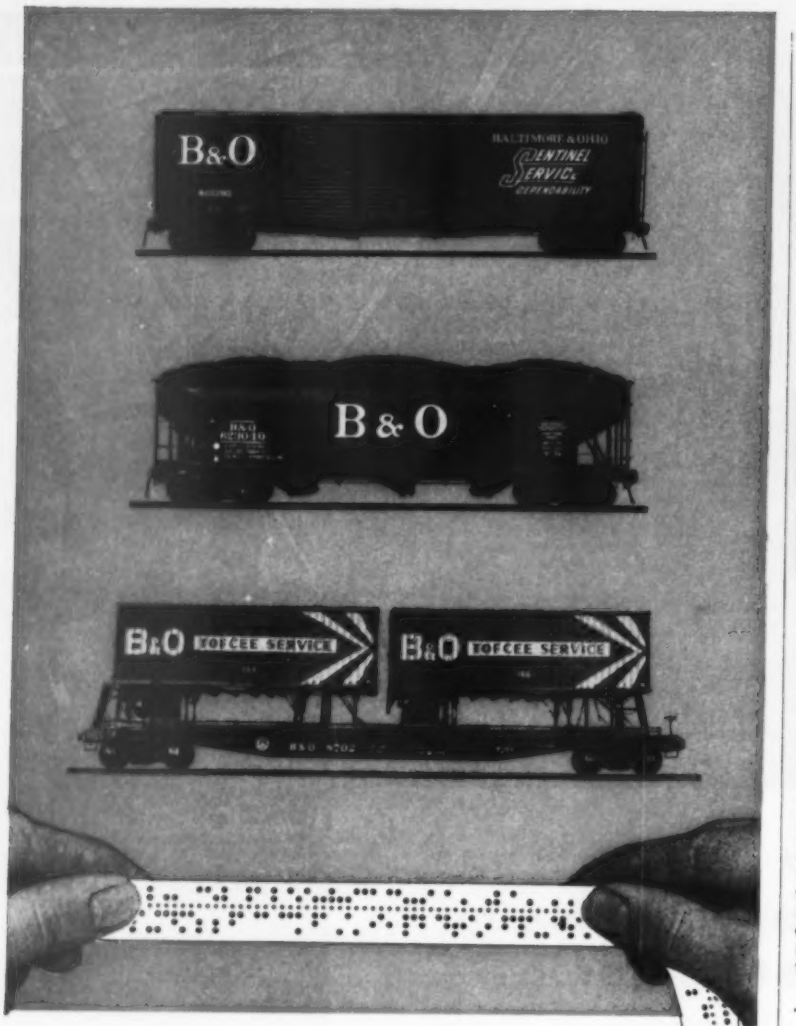
CONVEYOR SYSTEMS AND COMPONENTS



Shippers get an extra "measure of service" with B&O . . . DOT . . .

It's a new performance measure of electronic railroading! . . . DOT . . . picks up car movement information *progressively* from 29 key B&O yards . . . sorts and transmits it to B&O System headquarters 24 hours a day. . . . DOT's . . . continuous, speedy flow of car information lets 58 B&O traffic offices know where carloads are at all times . . . and it covers all commodities. You'll get extra shipping satisfaction from . . . DOT . . . ! Ask our man!

B&O DATA ON TRACING

B&O BALTIMORE & OHIO RAILROAD

The Line of SENTINEL Service • TIME SAVER Service • TOFCEE Service

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Our Cover Picture

● Our cover picture this month illustrates a welcome trend in the cement industry of the United States. For years, the industry's manufacturing plants have apparently been designed and constructed almost solely on the premise of utility, with little or no regard to attractive appearance. This despite the fact the construction of cement mills could logically be considered as one of the most appropriate areas in which to display the numerous striking methods and techniques that can be incorporated in building with concrete. Fortunately, utility of installations, and handsome utilization of the products made in those same installations, have come to be regarded within the industry as proper partners. An outstanding example of this attitude is the new Ideal plant at Tijeras, New Mexico, which is illustrated on our cover and on pp. 84-86.

Waste Quartz Chips Utilized In Novel Washington Plant

A plant for converting waste quartz chips into roofing chips, terazzo, chicken grit, and plaster sand was recently established in Okanogan, Wash. The operation began with an initial stockpile of 7,000 tons of waste purchased from a quartz crusher operation, and with washing and screening equipment purchased from another operator. The setup can handle from 8-10 tons a day, but can be readily expanded.

Jack Deyon, owner and originator of the successful operation, is a former West Coast logger who began a fish route in the Okanogan Valley in 1947, quadrupled the equipment and market, and sold the business in 1958. Mr. Deyon and his son are operating the quartz chip plant, and report excellent response to their products.

Enter 53 on card, page 177 →

Maneuvering into or out of narrow, twisting underground tunnels is easy for LeTourneau-Westinghouse Rear-Dumps. Model D can U-turn in less than 25'. If roof clearance is 14'8" or more, "D" can raise bowl and turn in a tight 18'8" of clearance.

Fast, clean dump by 11-yd D Tournapull Rear-Dump speeds rock to crusher at Fort Hartford Stone Co., near Hartford, Ky. Electric motors, standard on all Tournapull units, raise and lower bowl with speed and safety.

"Only units maneuverable enough to give us good production"

That's how Mr. A. C. Hall, owner of Fort Hartford Stone Co., Hartford, Kentucky, describes the 4 LeTourneau-Westinghouse D Tournapull® Rear-Dumps that move up to 225,000 tons of limestone a year from deep inside the firm's underground mine.

Three of the 11-ton-capacity L-W units are usually assigned to haul excavated rock from shovels working in the tunnels. They complete 6,000′ round trips . . . one third of that distance inside the narrow tunnels . . . in an average of 12 minutes. Of this operation, Hall says: "Large trucks just can't turn in the working area. 'D's' are the only machines that can maneuver in the tight quarters of the working faces without stopping. It cuts lost time."

Double-duty yard workers

Another "D" normally works in the open, stockpiling rock and gravel, and pushing rail-cars. At times, the whole L-W Rear-Dump force teams up with 2 front-end loaders to fill rail-cars in the yard. Rear-Dumps carry the material from crusher to stockpiles near the cars. Tractors then load it aboard. This "teamwork" loads a car in an average of only 12 minutes elapsed time.

Six years of tire use

"D" maintenance is easy. Hall cites tire-life as an example. "Our first Rear-Dump was new when we bought it," he said, "and it was six years before we had to replace a tire.

"Whenever I've decided to buy another hauler, I've considered all makes carefully. And I've always decided on a Tournapull Rear-Dump."

LeTourneau-Westinghouse Rear-Dumps are available in three sizes: the 138-hp, 11-ton "D"; 226-hp, 22-ton "C"; and 335-hp, 35-ton "B". Ask for a demonstration of the model best suited to your work.

DR-2006-MQJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

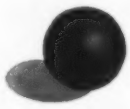
Where quality is a habit

Calumet Ni-Hard* Grinding Balls

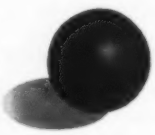
Save and Save and Save!

If you are dry grinding, you'll find that Ni-Hard grinding balls last from five to eight times longer than do alloy steel balls.

And in wet grinding, a recent test shows that .53 pounds of alloy steel balls were used per ton of ore ground. Under the same conditions but .30 pounds of Ni-Hard grinding balls were used.



The reason, of course, lies in the inherent hardness and long life of the Ni-Hard alloy plus the combination of modern equipment and close quality control. In the case of quality control, balls are heat treated in furnaces equipped with instruments which automatically note the time and temperature of each load. From this information, quality control can determine that each lot of balls receives the correct heat treatment to reduce the retained austenite to the proper level.



Balls are available from stock in the following sizes: 5/8", 3/4", 7/8", 1", 1 1/4", 1 1/2", and 2". Write for more information.

Reg. U.S. Pat. Off., Intl. Nickel Co., Inc.

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Enter 54 on card, page 177

Warren Brown, safety engineer, Pacific Cement and Aggregates, and Joseph C. Paulo, superintendent of the Centerville sand and gravel plant, look out over the yards of the plant which has operated 10 years without a lost-time accident.

Sand-Gravel Plant Wins Award For Accident-Free Record

Forty men of the Centerville, Calif., sand and gravel plant of Pacific Cement and Aggregates, Incorporated, were recently honored at a special safety award dinner at the Claremont Hotel in Berkeley, Calif. Their efforts made possible ten years of operation of the plant without a lost-time accident since the opening of the plant in 1949. The company also received an award from the National Safety Council.

Superintendent of the mining and crushing operation plant is Joseph C. Paulo, who has been with the firm for 18 years. Warren Brown is safety engineer for the firm.

The plant has a monthly production record of 142,000 tons of sand and gravel, and more than 10 million tons of materials have been produced since 1949. Pacific Cement and Aggregates operates 14 such plants in northern and central California besides 28 ready-mix yards and a 2,250,000-bbl. capacity cement plant near Santa Cruz.

• Correction

On page 123 of the July issue of PIT AND QUARRY, an equipment reference in the Riverside Oro Grande operation story slipped by in error. The two belt scale devices utilized between primary- and secondary-crushing buildings are manufactured by ABC's Scale Division, McDowell Company, Inc.

Enter 55 on card, page 177 →

Why use separate machines and operators on scattered tractor jobs?

Handle your widely-separated pit maintenance and clean-up jobs swiftly and economically with one man and a LeTourneau-Westinghouse Tournatractor®. This rubber-tired tractor speeds to the job under its own power . . . over paved roads, down shot-banks, cross-country or over railroad tracks. There are no delays while tractor crawls to new locations.

LW tractor gives you better speed at the work area, too. Acceleration is fast, with 218-hp operating through sealed anti-friction drive. Maneuverability is quick and easy. Also, there's no loss of momentum to shift gears, because this tractor's gears are constantly in mesh. Even reverse action is *instant*.

Handles wide variety of jobs

You can use just one Tournatractor to clean-up around 2 or more shovels . . . and at the same time maintain stock-piles, level waste dumps, clean debris off RR tracks, clean benches, handle shallow stripping, tow air-compressors, or pull supply and service wagons. You can even use this speedy, mobile tractor for maintenance and clean-up in one or more adjoining pits.

Biggest tractor value today!

In addition to giving you these plus operating advantages, LeTourneau-Westinghouse Tournatractor *costs less* to own, and *much less* to maintain than a track-type tractor of comparable horsepower. Let us demonstrate this rubber-tired tractor at your pit. Watch Tournatractor perform under *your* working conditions. You'll find it can handle scattered tractor jobs faster, more efficiently, to help cut your tractor costs.

◀ Powerful LW Tournatractor spreads and compacts conveyor-dumped mineral-bearing soil. At this plant, mobile rubber-tired tractor also pulls rail cars, handles dump maintenance, and operates a towed scraper.

CT-2101-MQI-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

new machinery

● LeTourneau-Westinghouse Company has introduced to the market a new V-8 diesel engine earthmover, the V-Power C Tournapull. It is a 270-hp. machine with a 20-cu. yd. heaped capacity C Fullpak scraper.

The C 'Pull's new, more powerful, optional engine is a 270-hp. GM8V-71 eight cylinder, two-cycle diesel which develops its rated horsepower at 2,100 r.p.m., while it reaches maximum torque at 1,-200.

Fast acceleration enables the machine operator to reach his haul speed 30 percent faster than with the standard powered C. Greater engine horsepower reduces the number of gear shifts necessary.

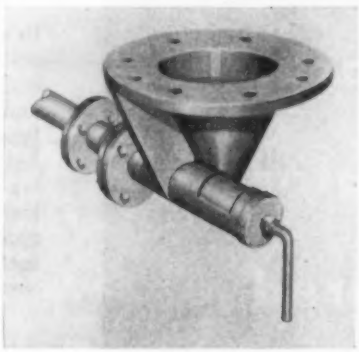
Practically all engine parts are interchangeable with other GM series 71 diesels. All components are readily accessible for service.

The unit's step gear transmission offers five forward speeds to 27 m.p.h. A heavy-duty 16-in. double plate air-assist clutch and a clutch brake are standard.

Also incorporated in the machine is the L-W power transfer differential, which uses a simple friction principle to transfer automatically up to 80 percent of engine power from a slipping drive wheel to the one on better footing.

The Fullpak scraper has an instant quick-drop scraper mechanism, which speeds the pumping of tough-to-load, dead materials into the scraper bowl. The scraper is readily interchangeable with other trailing units designed for use behind the prime mover. Currently available in the C size are a 22-ton rear dump and a 20-ton crane. (351)

● A variety of new material intake valves which can be used with all types of high vacuum pneumatic systems employed in the removal or



transport of dry, free flowing, powdery or granular materials from hoppers, bins, and dust collectors are now available through the U. S. Hoffman Machinery Corporation.

These material intake valves are suitable for use on 2-in. through 6-in. pipe lines and come equipped with standard 8-in. flanged connections which permit simple and rapid installations on any bin, hopper, or collector. While air is flowing, the rate of material intake can be adjusted. A separate air inlet prevents connected equipment from exposure to full suction of the vacuum system. Design of these material intake valves provides for thorough mixing of air and material to insure smooth, non-clogging flow. (352)

● An expanded line of shaft-mounted speed reducers recently introduced by the Dodge Manufacturing Corporation now includes a new 25:1 double reduction series in eight sizes. The line carries the trade name Torque-Arm.

Dodge engineers have improved the design of the double reduction reducers without changing their overall dimensions or horsepower ratings. Both 15:1 and 25:1 gear ratios are now available in housings of identical dimensions and at the same price. Output speeds range from 12 to 400 r.p.m.

Giant of the new series is the Size TD11, described as the world's largest shaft-mounted speed reducer offered from stock. Its reduction ratio is 24.73:1 and it is rated at 154 hp. at 75 r.p.m., which is the maximum recommended output speed for this size.

Seven other sizes with torque arms are available in either 15:1 or 25:1 ratios, along with three flange mounted reducers. Dodge is continuing its lines of 5:1 ratio single

and equipment

for further information use card on page 177

reduction Torque-Arm speed reducers and screw conveyor drives.

In redesigning the reducers, Dodge engineers have devised an improved method of attaching the torque arm to the reducer case, employing a saddle-type bracket for greater strength and better balance.

The 15:1 reducers supplied in the past are suitable for most applications, but the new 25:1 units will give 40 percent lower output speeds with identical motor speeds and V-drive ratios. When output speeds are the same, lower ratio V-drives may be used with the 25:1 reducers at reduced cost. **(353)**

● Motorola, Inc., has entered the industrial television field with the introduction of a line of five closed circuit television cameras and two monitors.

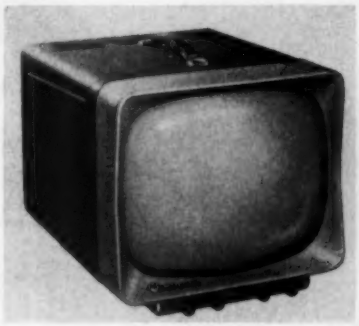
The basic Motorola general purpose camera, available in four versions, is a highly sensitive and stable instrument, providing 550-600 lines horizontal resolution. Weighing 12 lb. and measuring 5½ x 7 x 11 in., the camera puts out a 1-v. video signal into a 75 ohm coaxial cable. The camera uses a standard 16 mm. C lens mount and can accommodate a remote control four lens turret.

The four versions of this unit provide: (1) either automatic light compensation or manually controlled compensation; (2) either random interlace or locked interlace. The automatic models adjust by themselves for variations as much as 200 to 1 in light levels at the televised scene. This eliminates the need to make camera adjustments as lighting conditions change. On the automatic cameras, an on-off switch is the only operating control.

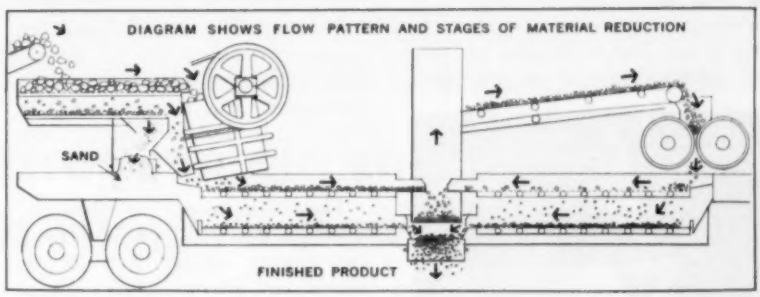
In the random interlace models, picture stability is assured through use of crystal controlled horizontal sweep circuits, power frequency controlled vertical sweep, and well shaped sync pulses. Extremely fine vertical resolution is achieved with the locked interlace models through use of a binary counter.

The fifth camera in the Motorola line is a viewfinder, broadcast quality unit for studio work in elaborate educational or industrial training television systems.

The Motorola industrial monitor has a 14-in. screen. Ruggedly constructed, it provides high brightness, 600 line resolution, and excellent stability.



A 21-in. receiver is the second Motorola monitor. This unit is capable of receiving both closed circuit video signals and regular off-the-air broadcast signals, and can be used as an audio amplifier. **(354)**



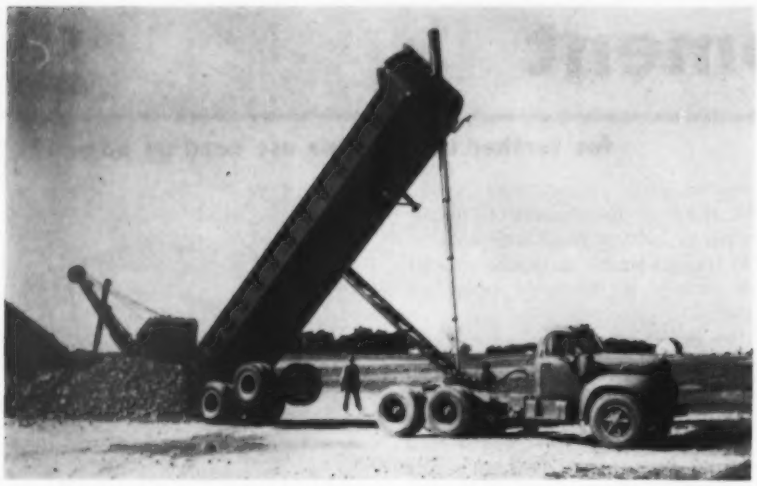
● Design of the new Champion crushing plant offered by the Johnson Welding & Equipment Company, Inc., eliminates all conveyors, except for one 11-ft. section. The plant is reported to have twice the screening area of standard crushing equipment. The screens serve a dual purpose—they convey and classify simultaneously, eliminating the time lost by recirculating material back to the screen.

When desired, all finished product in the pit can be by-passed from the second deck of the scalper to the main discharge simply by adding a 12-ft. conveyor section. The rotary lift handles no fines.

Following each stage of reduction the material is promptly discharged. All undesirable material is discharged immediately. The plant can also be equipped to produce washed material.

In addition to increased efficiency and speed of production, the Champion offers an important reduction in space requirements. The entire plant measures 39 ft. in length and 12 ft. in height.

The plant shown utilizes the following components: a 12x36 Lippmann Grizzly-King jaw crusher; a 42x24 Lippmann roll crusher; a 3- by 8-ft. Simplicity two-deck scalping screen; and two 4- by 10-ft. horizontal Simplicity double-deck vibrating screens. **(355)**



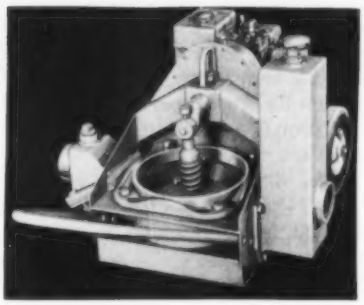
● A product of The Marion Metal Products Company, this Model FDT-180 dump body has a capacity of 18 cu. yd. It is pulled by a Mack B61ST tractor and has a Marion F815T-240 hoist.

Extras include Neway 536-3 suspension, SFA 18000# axles, 7-in. air brakes, and 1000x20 12-ply tires. **(356)**

● Williams Bucket Division, The Wellman Engineering Company, offers a new line of dragline buckets for light and general purpose serv-

ice, including sand and gravel operations. Lip, bottom scoop plate, and skid runners have been replaced by a heavy one-piece bottom, resulting in very smooth interior and exterior surfaces for fast digging and quick dumping.

Known as Williams type DC draglines, the new models are available in sizes from ⅜ through 1 cu. yd., with or without perforations. **(357)**



● An expanded line of diaphragm pumps available from the Barnes Manufacturing Company features lightweight, low, compact units in 1½-, 2-, 3-, and 4-in. models with capacities from 3,500 to 6,000 g.p.h. at 5-ft. lifts.

The 1½-in. model has a 2-in. discharge, is powered by a 2-hp. gasoline engine, weighs 145 lb. on wheels, and delivers 3,000 g.p.h. at 5-ft. lift. The 2-in. model has a 2-in. discharge, is powered by a 2.5-hp. engine, weighs 160 lb. on wheels, and delivers 3,500 g.p.h. at 5 ft. The 3-in. pump has a 3-in. discharge, is powered by a 2.5-hp. engine, and delivers 5,500 g.p.h. at 5 ft. Delivering 6,000 g.p.h. at 5 ft., the 4 incher has a dual-threaded suction connection permitting either 3- or 4-in. suction, has a 4-in. discharge, is powered by a 4.5 hp. engine, and weighs 460 lb. on wheels.

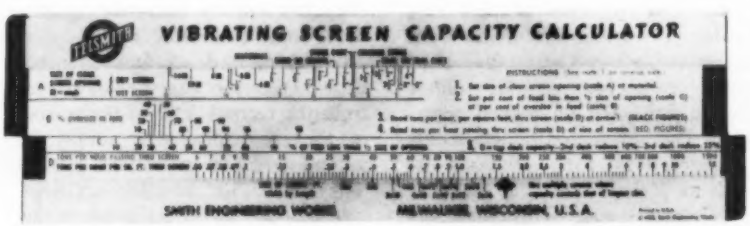
Variable power pumps are available in a 2-in. model with 3,500 g.p.h. capacity and a 3-in. pump delivering 5,500 g.p.h. at 5 ft. Pumps are available with electric motors or without power but geared for either 1,750 or 2,400 r.p.m. power source owned by the customer. **(358)**

● A 42-in. diameter Micronizer fluid energy mill, described as the largest ever manufactured, has been fabricated by the Sturtevant Mill Company. The mill increases grinding capacity 50 percent over the 36-in. unit, formerly the company's largest unit. It has a maximum capacity of from 750 lb. to over 3 t.p.h., depending upon material and fineness desired. The new mill will be employed in the grinding of titanium dioxide to the immeasurable micron and sub-micron range.

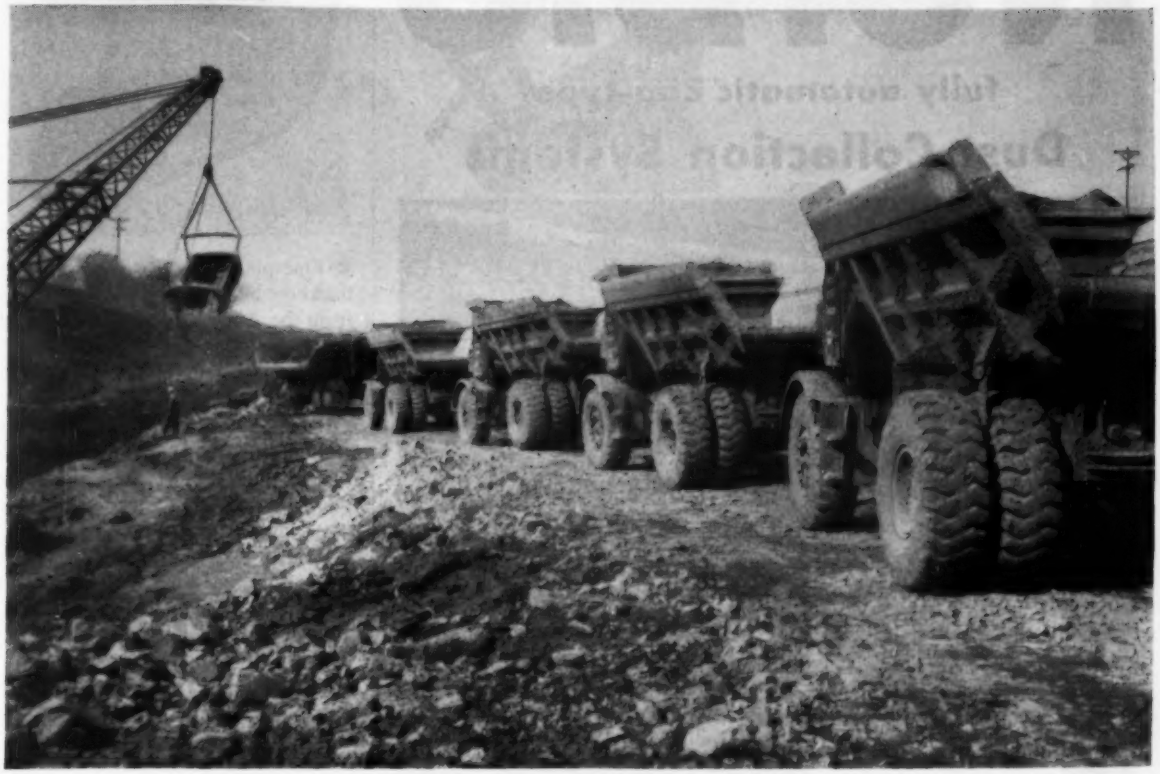
This new mill, without moving parts, causes micron-grinding particle collision through jet action. It brings to ten the number of different-sized Micronizers now offered by Sturtevant for fine-grading activities. The smallest, a laboratory research unit, is 2 in. in diameter. **(359)**

● A new Telsmith vibrating screen slide rule available at no cost from Smith Engineering Works gives, in seconds, tons per hour per square foot through screen cloth and capacity of any size screen.

This handy slide rule will help an operator select and buy the best and most economical size of vibrating screens for his particular needs. It takes into consideration the kind of material to be screened; size of screen openings; percentage of oversize in the feed; percentage of feed less than one-half the size of screen openings; whether top, second, or third deck; shape of screen openings; and screen slope. **(360)**



B.F.Goodrich



B.F.Goodrich tires handle the tough jobs at mammoth Niagara Power Project

UNDER construction at Niagara Falls, N.Y., are the powerhouse, waterways, reservoir and intake—all part of the gigantic $720-million Niagara Power Project. Shown above: site of 110′ x 50′ excavation for one of the twin, 46′-wide, covered intake conduits. On the job: a fleet of trucks equipped with B.F.Goodrich tires and owned by Merritt-Chapman & Scott Corporation, largest contractor on the project.

These trucks haul ton after ton of rock and overburden from the excavation to the spoils area, work round-the-clock, 6 days a week, under severe operating conditions. In spite of this, B.F.Goodrich Rock Service tires are still going strong after 3,135 hours of service!

The Rock Service tread is specially-compounded to resist rock cuts and snags. Massive double-chevron cleats give extra traction in forward or reverse. Thanks to the special B.F.Goodrich FLEX-RITE NYLON cord body, Rock Service tires are virtually immune to heat blowouts and flex breaks. Result: you get longer tire life—more retreadable tires!

Other B.F.Goodrich products at work on the Niagara Power Project are conveyor belting, air hose, protective clothing and footwear. Maintenance and service programs for tires and industrial products are also in operation—all part of the new B.F.Goodrich Unified Contractor Program. No matter what your off-the-road job, B.F.Goodrich is ready to serve you—and help you save. Your Smileage dealer is listed under Tires in the Yellow Pages of your phone book. *The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

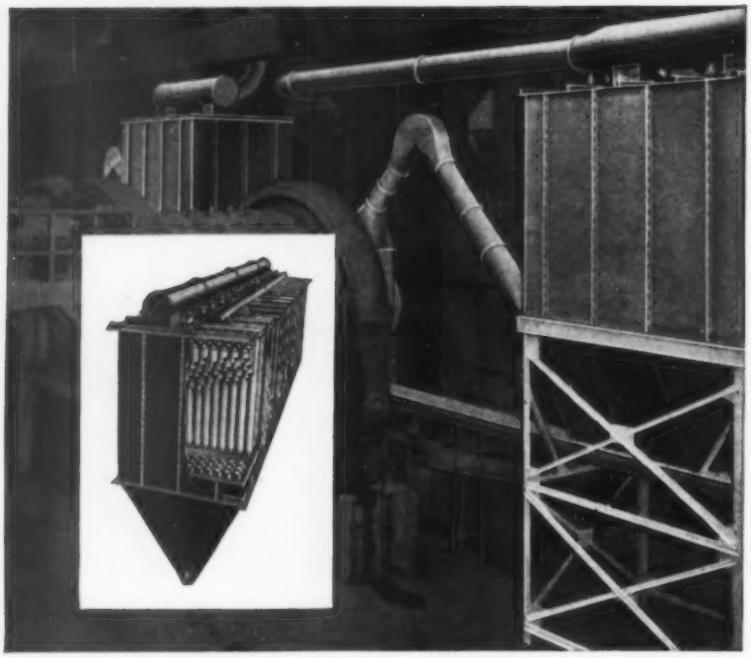
Smileage!

B.F.Goodrich *off-the-road tires*

Norblo

fully automatic bag-type

Dust Collection Systems



Dependable Heavy Duty Service at Low Cost

Continuous operation at full rated capacity is the performance that Norblo Equipment delivers every day in many types of plants. Norblo's rugged construction, basic unit compartment and few moving parts insure low cost of operation and maintenance. A most important advantage of this equipment is its adjustability for varying dust loading which can be made in a few minutes without shutting down the installation.

Modern industrial "housekeeping" calls for the removal of injurious or "nuisance" air contaminants in the interest of highest efficiency. For certain industries, *recovery* is important also. In large scale operations even small fractions of a per cent better efficiency of fume or dust recovery can mean thousands of dollars a year gained.

Investigate the possibilities of Norblo Dust and Fume Collection for cleaner air, or for recovery of valuable material. Write for Bulletin 164.

The Northern Blower Company

6407 Barberton Ave., Cleveland 2, Ohio • OLympic 1-1300

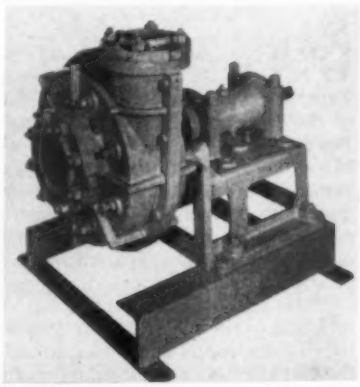
Norblo ENGINEERED DUST COLLECTION SYSTEMS FOR ALL INDUSTRIES

Enter 60 on card, page 177

○ One-piece cast manganese steel backhoe buckets are now available from the American Manganese Steel Division equipped with a cast attachment arch and Simplex two-part teeth.

The arch is cast with a box cross-section to provide greater strength, and is made integral with the main bucket casting by means of shear plugs and fillet welding, and is inset. The ¾-cu. yd. bucket shown is built for service on a Bucyrus-Erie 22B and is available, through 1½-cu. yd. size, for other machines requiring an arch attachment.

The two-part teeth with reversible tips extend digging life and maintain sharpness. These tips are easily replaced by knocking out a retaining pin, removing, and inserting a new tip. Adapters, made of the same alloy, fit these tips to any backhoe. **(361)**



● A new ceramic lined sand and gravel pump which is highly resistant to abrasion has been introduced by The Kansas City Hay Press Company. Designated the Model RXA, the unit has been designed primarily to lengthen the service life of pumps handling fine,

"Profitable production" through modernization

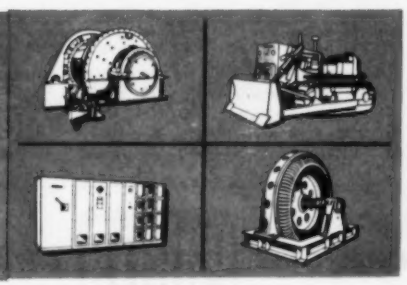
Modernizing toward *profitable production* differs from plant to plant. In some plants it calls for starting from scratch with a complete replacement of equipment. In other operations, the answer lies in supplementing existing equipment and/or developing a more efficient flow. In all cases prime consideration should be given such factors as reduction of fuel consumption, power demands, maintenance.

Help for you... Allis-Chalmers manufactures a most diversified line of processing machinery and electrical equipment. Each product department is staffed with research, design, manufacturing and application specialists. A "heads-together" approach — an interdepartment exchange of ideas and the correlation of specific skills — paces the solution of each modernization problem. In short, integrated thinking, planning and engineering precede the integration of equipment.

Step one... see your local A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.

Allis-Chalmers Products for the Rock Products Industries

Kilns • Grinding Mills • Crushers
Vibrating Screens • Pumps
Dryer-Coolers • Motors • Control
Compressors • Switchgear
Unit Substations • Steam Turbines
Earth-Moving Equipment



A-C ALLIS-CHALMERS

A-1044-CM

Rotary Cement Kiln lined with Laclede-Christy refractories.

Laclede-Christy refractories CUT MAINTENANCE COSTS, REDUCE DOWN TIME in cement and lime kilns

Operating practice in cement and lime plants varies widely. A combination of the right refractories, properly installed, means substantial savings in down time and maintenance costs.

Laclede-Christy kiln liners and other refractories have been developed to meet the particular requirements of the cement and lime industry. Your Laclede representative can provide valuable product and engineering experience in helping you get the longest lining life at lowest cost. Call him. Or, write to *Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*

LACLEDE 70 (70% Alumina) — For hot zones of Rotary Cement Kilns; calcining zones of Lime Sludge Kilns, Dolomite Kilns, and Magnesite Kilns.

PEERLAC (60% Alumina) — Intermediate zones of Rotary Cement Kilns, calcining zones of Lime Sludge Kilns, burning zones of Lime Kilns.

WALLAC (High Duty, Stiff Mud)

SPALLAC (Super Duty) — Intermediate zones, Rotary Cement Kilns.

FIRMCAST (Extra strength castable, abrasion-resistant, for chain sections of Rotary Cement Kilns)

KING (High Duty, Dry Press)

SPECIAL SPALLAC (Super Duty, High Burn)

SUPER PLASTIC (for Kiln Firing Hoods)

LACLEDE ARCHES (for Clinker Coolers)

REFRACTORIES PORTER DIVISION

H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

Enter 62 on card, page 177

abrasive materials or acidic liquids. Volume is in the range of 150 g.p.m. at 110-ft. head to 600 g.p.m. at 70-ft. head.

With ceramic lining of silicon nitride bonded silicon carbide wear parts, the RXA will operate as long as two years without major repairs to the shell or impeller, claims the manufacturer. (362)

● Long patches suitable for repairing frayed or injured edges on conveyor belts have been added to the line of Pang cold self-vulcanizing repair material offered by the Automatic Vulcanizers Corporation.

The long patches have feathered thin edges and come in the following sizes: 1⅝ in. wide by 20 in. long (#PLC 4-50) and 3⅞ in. wide by 20 in. long (#PLC 10-50). They require no heat or equipment and cure at low temperatures, providing a fast, easy method of conveyor belt repairs. (363)

● Addition of the L-100 Series economy loader to the line of earthmoving equipment produced by the Henry Manufacturing Company, Inc., has been announced.

Designed for mounting on utility tractors, the L-100 Series has a break away capacity of 2,500 lb. Model L-100S has one bucket cylinder; Model L-100D has two

New ROM vibrating screen

Shakes off brutal battering

...is handling 1000 tph of 48-inch limestone

High tonnages — hour after hour, day in, day out — such are the demanding conditions under which this screen is setting new performance standards.

Built for heavy-duty service, its husky support frame ignores persistent pounding. Its giant bearings are designed for long life. And as big as it is, vibration isolation on this *extra heavy duty* screen is handled effectively by air springs or steel coil springs.

For complete information, see your Allis-Chalmers representative or write for Bulletin 07B8368, Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.

There's an Allis-Chalmers screen for every rock products application

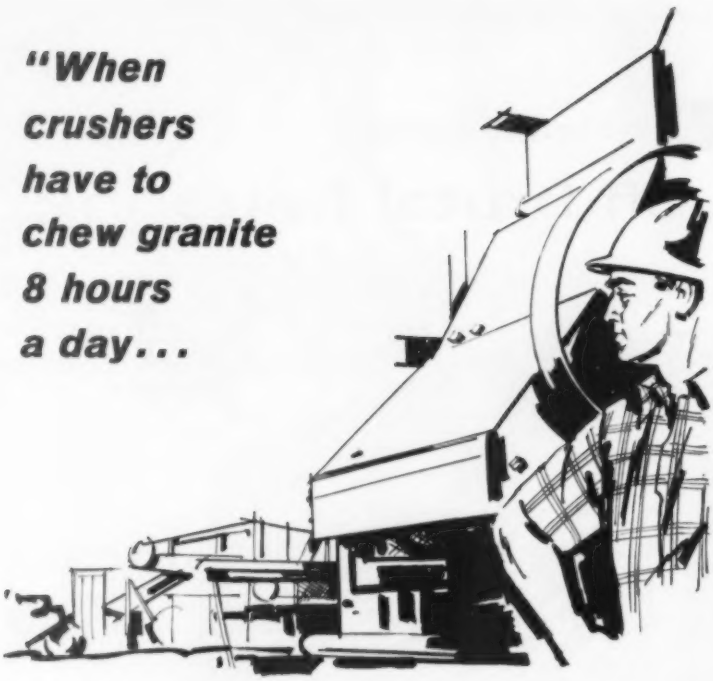
A complete line of inclined screens for scalping, specification sizing, washing, rinsing, plus the headroom-saving *Low-Head* horizontal screen for heavy media recovery.

Planning a heavy media process? It will pay you to specify Allis-Chalmers screens.

Low-Head is an Allis-Chalmers trademark.

ALLIS-CHALMERS A-5941-CM

"When crushers have to chew granite 8 hours a day...



IT PAYS TO HARDFACE THEIR JAWS WITH **R-MANG®**"

AIRCO R-MANG HARDFACING WILL GIVE LONG LIFE AND HIGH IMPACT RESISTANCE TO ALL MANGANESE STEEL CASTINGS

You can add to the useful life of every manganese steel casting subjected to severe impact. Hardface with Airco R-Mang and you armor such hard biting parts as crusher jaws, dipper teeth and bucket lips with the toughest steel known. Great for repairs, too, when wear has been caused by abrasive impact. Operators find R-Mang an easy handling electrode, in either coated or bare form.

AIRCO R-MANG molybdenum manganese electrodes are made from cold drawn heat treated core wire, and are supplied either bare or coated. Hardness of deposit will be in the range of 13-17 Rockwell C in as-welded condition. After work-hardening the deposits will show an increase in hardness to 50-54 Rockwell C. Diameters: 5/32", 3/16", 1/4" and 5/16".

TO IMPROVE ALL YOUR HARDFACING WORK—AND ALL YOUR WELDING—CALL IN YOUR AIRCO MAN

Airco experience in hardfacing and welding includes the making of hundreds of electrodes of all classes and types, and the production of all industrial gases, equipment and supplies used in hardfacing and welding. We'd like to put this experience to work for you. Just call your nearby Airco office or Authorized Airco Dealer. You'll find him listed in the "Yellow Pages" under "Welding Equipment and Supplies."

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Enter 64 on card, page 177

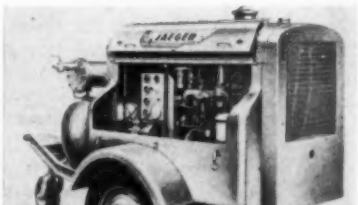
bucket cylinders. Double acting lift and bucket cylinders are standard on both models.

Adapter brackets are provided to mount the L-100 Series on the following tractors: International Harvester 240 and 340; Allis-Chalmers D-14; John Deere 430W and 430U; Ford 600-800; Ferguson 35; Massey-Ferguson 202; Oliver 550; and Case 310. **(364)**

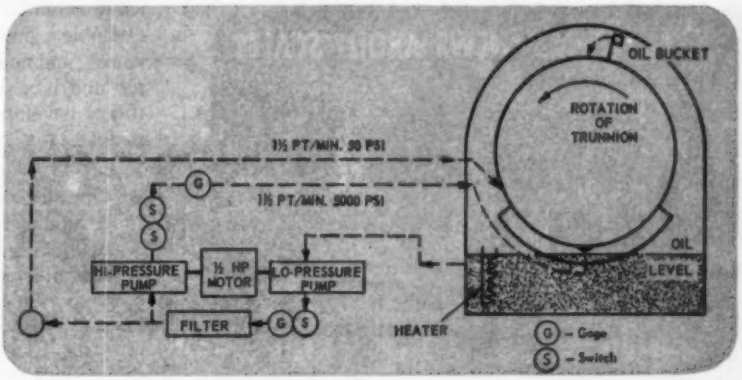
● PliRam, a line of four ramming mixes, has recently been introduced by the Plibrico Company. All PliRam ramming mixes have P.C.E.'s above Cone 38 (3,335 deg. F.) and form very dense monolithic linings which are exceptionally stable and non-wetting. They are reported to have excellent load bearing characteristics and are highly resistant to abrasion, acid attack, slag formation, and metal penetration.

PliRam 80 and 90 are heat setting materials with temperature service ranges of 2,000-3,200 deg. F. and 2,000-3,400 deg. F., respectively. With a weight of 175 lb. per cu. ft., PliRam 80 has an 80 percent alumina content. PliRam 90 has an additional 10 percent alumina and has a weight of 185 lb. per cu. ft.

The other products in the line, PliRam 80-S and 90-S, are similar to the above, but have chemical as well as heat setting characteristics which provide each with a modulus of rupture 50 percent greater than its counterpart and more at some temperatures. **(365)**



● All the features of the larger Jaeger rotary compressors are offered in this latest Model 85 from The Jaeger Machine Company. It is powered with a Continental F-162 engine developing 45 hp. at sea level and equipped with a 12-v.



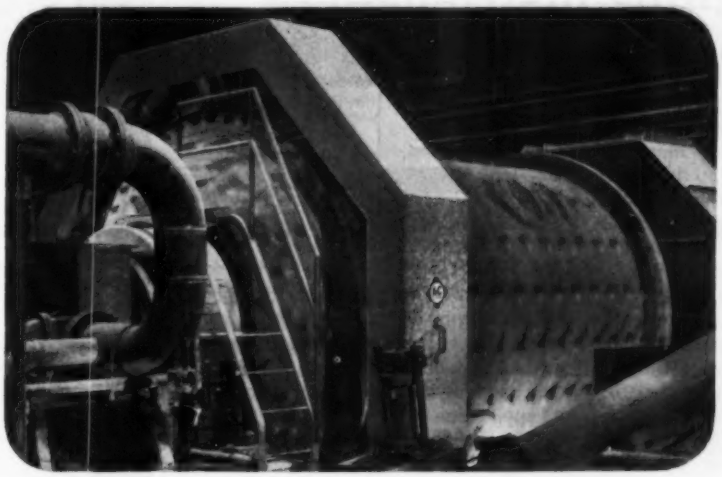
Floating start, ride and stop for big mills

New Lubritrol system provides constant lubrication for trunnion bearings

The new, bigger Allis-Chalmers mills now grinding out profits in progressive rock products plants actually *float on oil.* No bearing-wearing starts. Horsepower waste is kept at minimum. No dry sliding after shutdown. All functions of the *Lubritrol* system are automatic . . . controlled by foolproof pressure gages and switches. Filter removes contaminants.

When you modernize your rock products operation with a bigger mill, insist on Allis-Chalmers — the only mill that gives you the positive protection . . . the operating and maintenance economy of *Lubritrol* constant lubrication.

For complete information, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.



Plan to stay ahead... MODERNIZE!

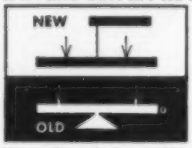
Lubritrol is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-5934-CM

How do they build unvarying accuracy into this remarkable new kind of weighing instrument?

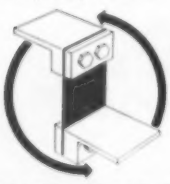
For 7,000 years men have employed the multi-part pivot balance to compare weights. As the parts of their pivot joints wore, the problem of retaining accuracy became more and more acute. Then in 1956 the United States issued a patent for a "Thayer Flexure Plate" Leverage System. A team of engineers and businessmen, aware of industrys great cumulative loss of materials in weighing operations, had devised a revolutionary new scale. Knife-edge pivots that progressively wear and change were replaced by Thayer Flexure Plates that move only .001", yet accurately reflect the minutest changes in weight. This *firmly joined* lever withstands shocks and vibrations indefinitely. Dirt and dust are no longer a problem.



Thayer guarantees this leverage system accurate for the life of the scale.

How Can It Save You Money Year After Year?

Working in conjunction with straight electrical controls, it forms the most reliable, low maintenance system ever devised to control processing or materials handling *by weight*. Literature on its application to filling, batching and checkweighing operations is available on request.



THAYER SCALE

AUTOWEIGHTION SYSTEMS FOR FILLING, BATCHING AND CHECKWEIGHING

THAYER SCALE CORP. THAYER PARK, PEMBROKE, MASS.

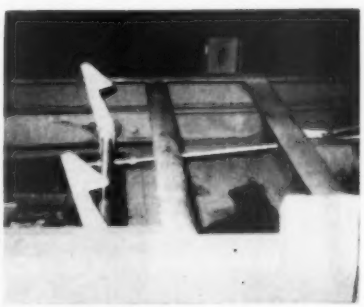
Enter 66 on card, page 177

electric starter. Standard equipment includes an hour meter, automatic blow-down valve, thermostatically actuated oil by-pass valve, retractable pneumatic tired dolly wheel, and fenders. The compressor unit is a single-stage, oil-cooled rotary developing 85 c.f.m. at normal 100 p.s.i. pressure. (366)

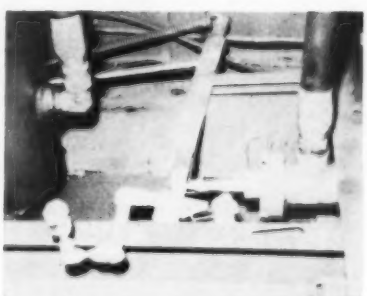
● Vibration and wear in dump trailer bodies can be eliminated with a new locking device from the Trailco Manufacturing and Sales Company. Suitable for installation on all makes and models of dump bodies, the new Lock-O-Matic eliminates wear which occurs in the body, the chassis, and in the packing glands of the hydraulic lift itself.

Heavy spring-loaded clamps rigidly secure the body to the frame while the trailer is on the highway. The unit is automatic, self-contained, and cannot jam.

When the hydraulic system is engaged to start the lift operation, an interim valve activates a clearing control on the mechanism and the clamps are swept free of the trailer body. Actual lifting force cannot be applied until the clamps are cleared. When the body is returned to road

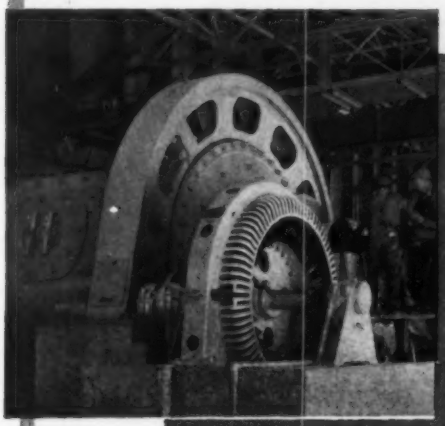


Clamps are secured over channel iron on bottom of trailer body.



The clamps are held firmly in position by pressure from a rod held in tension by a spring shown above.

New insulation adds years to motor life



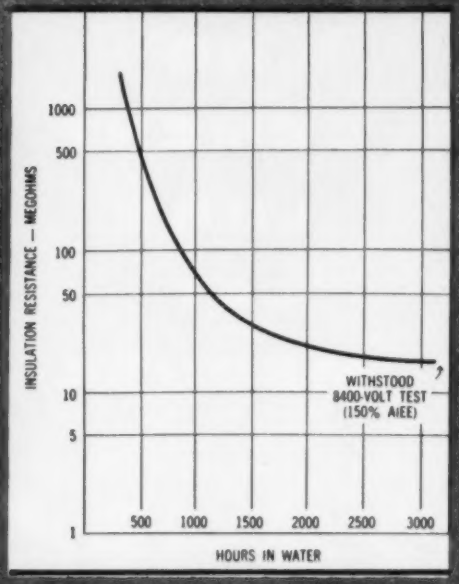


Chart shows insulation resistance in water of a 2300-volt Silco-Flex insulated coil, completely immersed with 2300 volts applied continuously.

Silco-Flex Insulation | *Polyester Mica Tape* | *Asphaltum Mica Tape*

Sandblasting proves the difference! Only *Silco-Flex* insulation stood up after one minute using 90-grit aluminum oxide and 100-psi air from distance of 6 inches.

Super-Seal motors withstand abrasion, physical stresses, moisture, heat aging

A drip-proof enclosure is usually all you need with the remarkable new insulating systems and advanced mechanical features of *Super-Seal* motors.

New motors are protected with the *Silco-Flex* stator coil insulating system: A homogeneous dielectric barrier of vulcanized silicone rubber possessing unmatched resistance to abrasives, moisture and most corrosive or chemical atmospheres.

Synchronous machines have *integrated* field coils that seal against contaminants . . . bond and lock against mechanical forces.

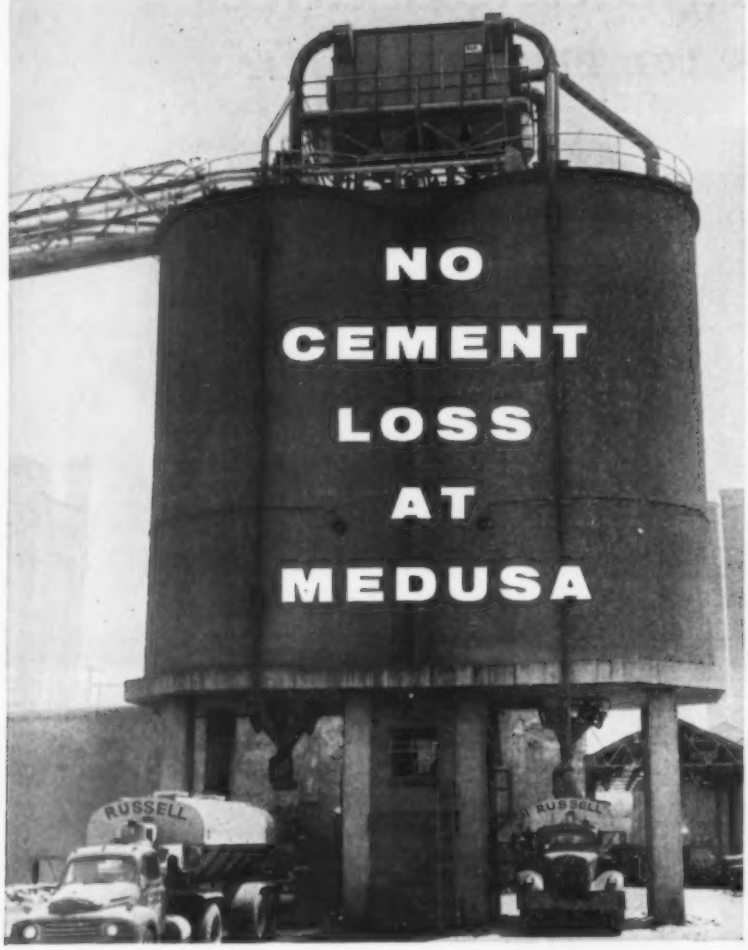
Contact your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

Super-Seal and Silco-Flex are Allis-Chalmers trademarks.

A-5922-CM

ALLIS-CHALMERS

SLY DYNACLONES...



Are your bulk-loading stations as dust-free as this? They can be, and your cement savings can compare with those at Medusa Portland Cement Company, Wampum, Pa. The two Sly "Roll-Clean" Dynaclone Dust Filters pictured save 120 pounds per hour during truck loading, and 240 pounds per hour during silo loading.

The "Roll-Clean" Dynaclone maintains constant, uniform suction at dust sources to collect *all* the dust. It has a new roller cleaner for simplified automatic self-cleaning. And it is now available with new "Resist-O-Wear" filter bags (patent pending) that give as much as 3 times longer life.

Get the complete Dynaclone story . . .
Send for 36-page Catalog 104

SINCE 1870 SLY

SEE THE DYNACLONE in Space 73, the Chemical Show, New York Coliseum, Nov. 30-Dec. 4

THE W. W. SLY MANUFACTURING CO.

4745 TRAIN AVENUE • CLEVELAND 1, OHIO
OFFICES IN PRINCIPAL CITIES

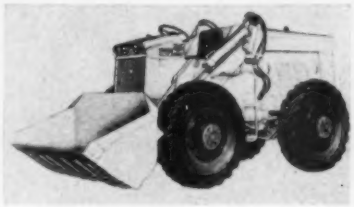
OVERSEAS LICENSEE: ANDREW AIR CONDITIONING LTD., LONDON S.W. 1, ENGLAND

Enter 68 on card, page 177

position, the clamps are automatically engaged and locked in position, assuring a vibration-free connection between the trailer body and the chassis. **(367)**

● Specially designed for speeding excavating-loading work in sand and gravel yards, the new Model TL-16 TractoLoader, offered by the Allis-Chalmers Manufacturing Company, weighs 18,000 lb. and has a carry capacity of 7,000 lb.

Available for use with the new unit are five buckets, ranging in size



from 1½ to 4 cu. yd. Buckets tip back 40 deg. at ground level for rapid loadings. For additional stability while traveling, the buckets tip back at an angle of 45 deg. when at carry height (14 in. above the ground). Depending upon the bucket size, dumping clearance under the bucket cutting edge ranges from 8 ft. ½ in. to 9 ft. 3 in. Measured from the front of the frame, the reach is 4 in. greater.

The TL-16 TractoLoader can be obtained with either a 109-hp. Hercules gasoline engine or a 104-hp. Allis-Chalmers diesel engine. Top travel speed of the unit in either forward or reverse is 27 m.p.h.

Features include a single stage 3.5:1 torque converter, rear wheel power steering, four-wheel power brakes that can be operated by either right or left foot, and a separate positive-locking mechanical parking brake. Planetary-type axles are pin-connected to a rugged, welded one-piece frame for greater rigidity and strength. The axles have high traction differentials. **(368)**

● New aluminum dump trailers introduced by the Galion Allsteel Body Company are adaptable to any single or tandem trailer chassis and suitable for transporter and material hauling. Galion's new aluminum body line includes body styles avail-

Diesels work nine to twelve hours daily, get three years between overhauls

Courtney & Plummer does it with Cities Service C-300 Motor Oil.

With four crushing plants, sixty dump trucks, and a host of shovels, cranes, and miscellaneous equipment, Courtney & Plummer still finds it necessary to work nine to twelve hours a day, 5½ days a week to meet its tremendous production schedule.

Clearly, this schedule would be impossible if interrupted by frequent overhauls—but overhauls are few and far between at Courtney & Plummer. In fact, using Cities Service C-300 Motor Oil, diesels are getting three years before overhaul and dump trucks are running as high as 150,000 miles, with long periods of idling.

Even more significant, Courtney & Plummer has discovered it can use Cities Service C-300 Motor Oil in the engines of *all* its various types of diesel and gasolene powered equipment . . . with no need to stock several oils.

If you'd like to simplify *your* motor oil inventory and extend periods between overhaul, too, get the facts about versatile Cities Service C-300 Motor Oil. Talk with a Cities Service Lubrication Specialist, or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

80,000 to 150,000 Miles Between Overhauls is record rolled up by Courtney & Plummer's 60 dump trucks aided by Cities Service C-300 Motor Oil. And mileage tells only half the story, since trucks spend many hours idling as well.

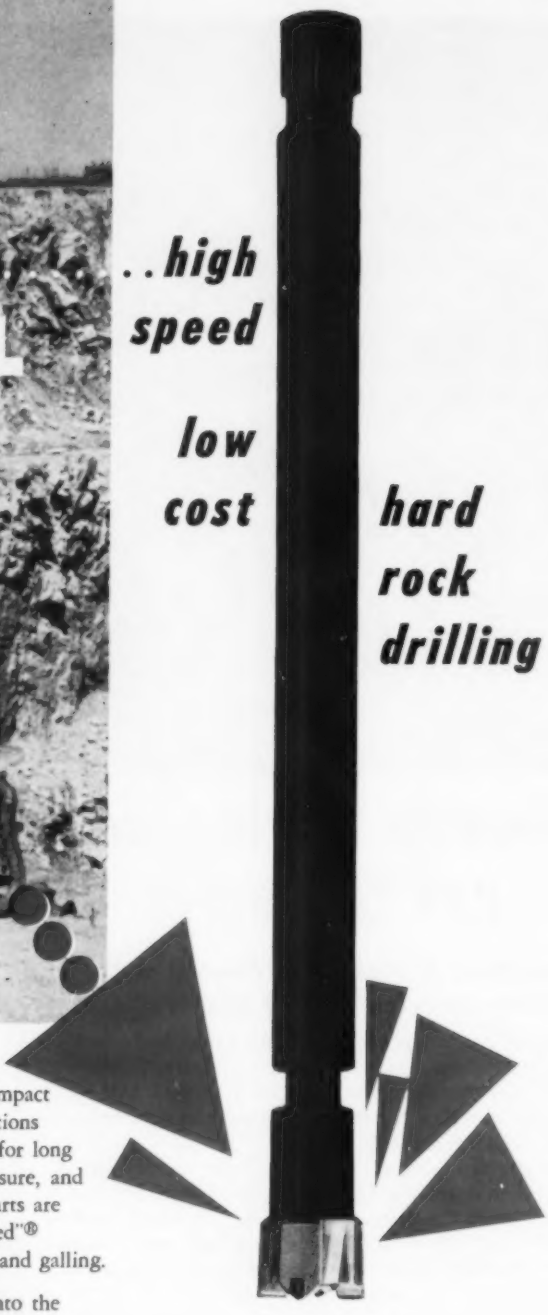
A Million Tons of crushed stone and aggregate a year are produced by Courtney & Plummer, with equipment often in service 12 hours a day to meet the tight schedule. The firm has three portable crushers and one stationary plant.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

MISSION HAMMERDRIL

..high speed low cost hard rock drilling



Patents Issued And Pending

The Mission HAMMERDRIL® is a "bottom hole," pneumatic impact tool, rugged enough to drill through the hardest of rock formations *day in and day out*. The HAMMERDRIL is designed and built for long life, low upkeep. There are two moving parts in the high pressure, and only three moving parts in the low pressure tool. All impact parts are of heat treated high alloy steel. All moving parts are "Missionized"® —a special surface treatment—to reduce corrosion, friction, wear, and galling.

Eight years of development and testing by Mission have gone into the HAMMERDRIL, to make it reliable and economical in use. In addition, the HAMMERDRIL can be used on your present standard rotary rig with suitable air compressor capacity.

The Mission HAMMERDRIL is sold and serviced throughout the United States. Write to Mission for more information and for what HAMMERDRIL can do for you—faster drilling, lower cost per foot.

Nothing but the finest will bear the name of

MISSION MANUFACTURING CO.

MISSION MANUFACTURING CO., P. O. Box 4209, Houston, Texas • Cable Address—"Missco" • Export Office: 30 Rockefeller Plaza, New York. In The United Kingdom: MISSION MANUFACTURING CO., LTD., 17 Hanover Square, London, W. 1 England • Cable Address—"Missoman"

PISTONS • PISTON RODS • SLIPS
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CENTRIFUGAL PUMPS

69—501

able with or without longitudinals. Specifications call for $\frac{3}{16}$-in. sides and floors, 4-in. channel cross members, and 5-in. I-beam longitudinals (when specified).

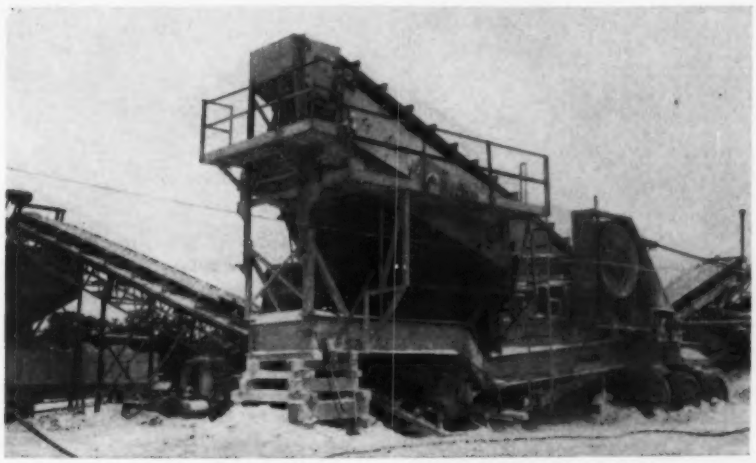
Aluminum dump trailer bodies are designed for greater weight savings in states where weight laws allow high individual axle weight limits with relatively low gross weight.

Galion supplies the entire aluminum trailer package, including body, hoist, and chassis mounted with tractor kit, I.C.C. lights and reflectors, and mud flaps. Either front-mounted or twin underbody telescopic hoists are available. (369)

● To permit fast, easy up shifts without double clutching, the Fuller Manufacturing Company has incorporated an air-powered countershaft inertia brake as standard equipment on all Fuller transmissions designed for heavy-duty, off-the-highway service.

Pre-selected by the operator simply by pressing a button, the Fuller countershaft brake slows the rotation of the transmission countershaft, main drive gear, and clutch driven plate or plates. Actuation is automatic as the transmission is shifted through neutral, and, because there is no need for the operator to double clutch, deceleration of the vehicle is held to a minimum.

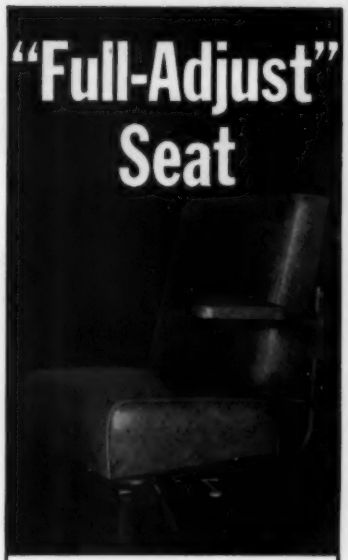
The Fuller countershaft brake system provides a time cycle of 2/10 second during each application. At the end of this time the brake system is exhausted and the pre-select valve automatically reset for further use. (370)



● Claimed to be the world's largest secondary crusher for portable operation, this 60x30 roll crusher was built by the Lippmann Engineering Works, Inc., for W. O. Pelphrey, Fort Worth, Tex. The secondary plant, working in conjunction with a 30x42 Lippmann portable primary plant, produces over 5,000 cu. yd. of material per day. It has turned out as much as 7,575 cu. yd. in a single day's production.

Primary equipment at the Pelphrey operation includes a 42- by 35-in. portable apron feeder; 4- by 8-ft. heavy-duty double-deck scalping screen; 30-42 Grizzly-King jaw crusher; 36-in. by 30-ft. product discharge conveyor; and a 30-in. by 12-ft. reject conveyor.

The secondary plant utilizes a 36-in. by 50-ft. feed conveyor; 60x30 roll crusher (pictured); 5- by 14-ft. triple deck screen; and two 24-in. by 12-ft. reject conveyors. All equipment is made by Lippmann. (371)



... another reason why

Autocar is the World's Finest

Up or down—forward or back—tilt! At the touch of a lever. This is the comfort of the contour seat in your Autocar cab. It's just one more quality characteristic that makes Autocar the world's finest heavy hauler.

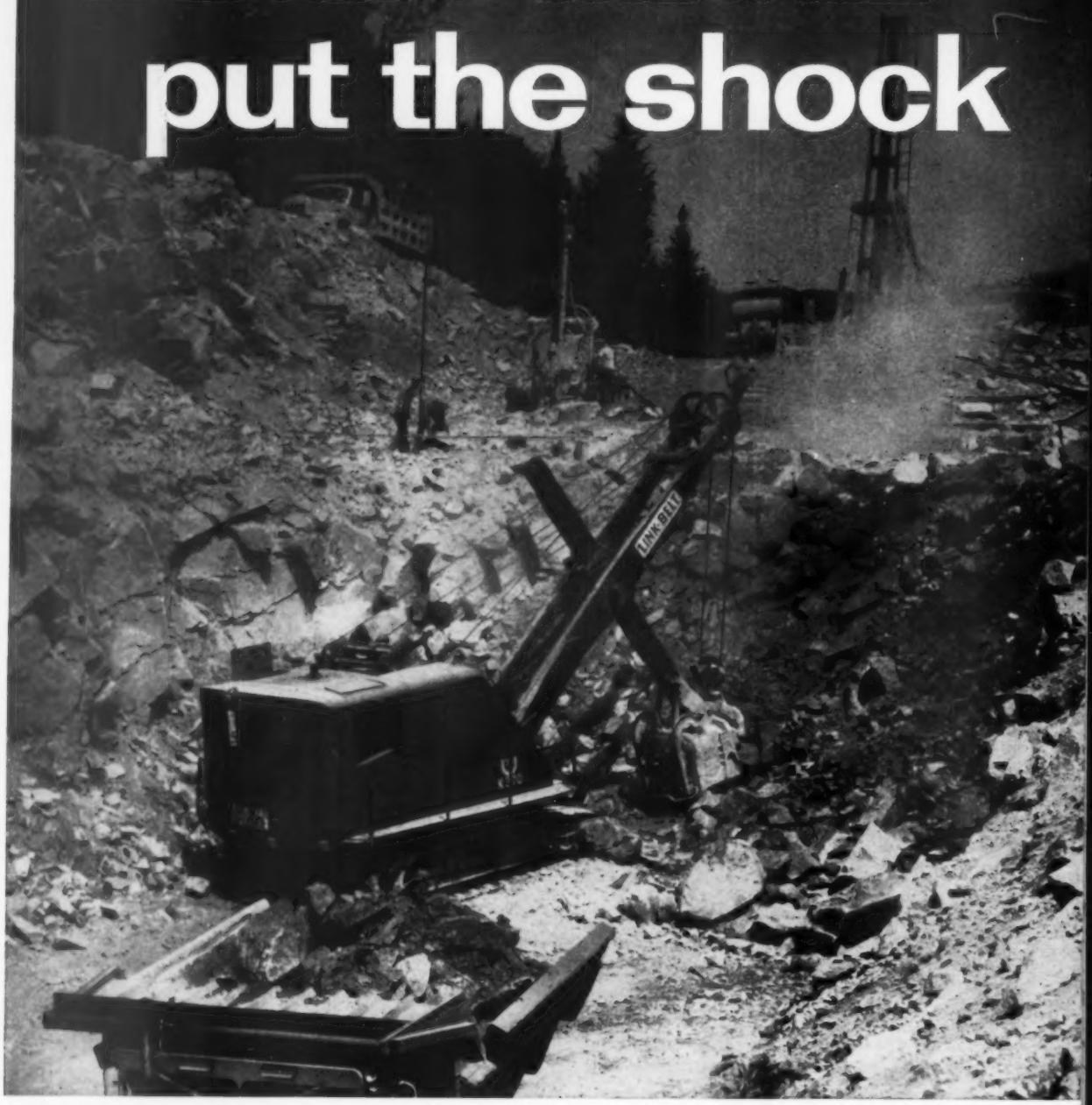
Autocar
"World's Finest"

Division of
The White Motor Company
Exton, Pennsylvania

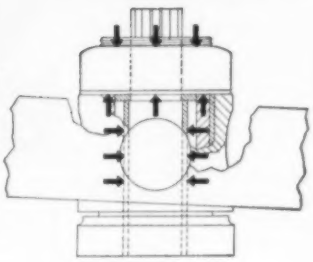
Enter 71 on card, page 177

LINK-BELT SPEEDER K KING-SIZE K MODELS

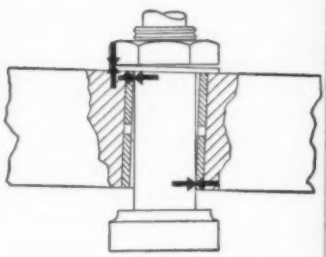
put the shock



THIS—Link-Belt Speeder rotating base is trunnioned to the centerpin. Despite tilting action of the upper, there's perfect alignment of the centerpin and the bushing, plus full-length distribution of loadings to minimize stress and wear on centerpin.



NOT THIS—Without exclusive centerpin trunnion, tilting action of the base causes concentrated bending forces on the centerpin and prying action on the centerpin nut. Result is gouged centerpin bushing when swinging . . . repeated repairs.



in the rock...

come back for more!

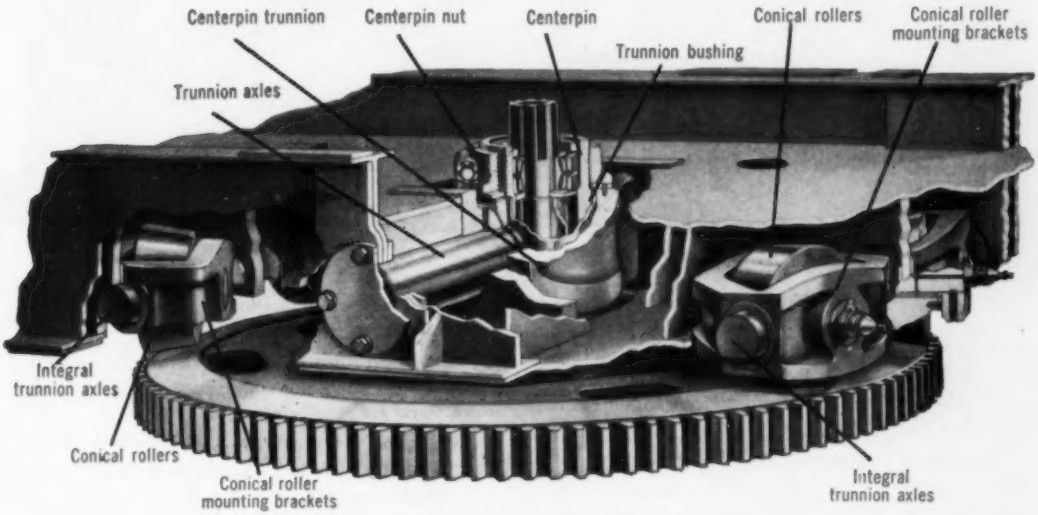
TOUGH CUTS OR BRUTE LIFTS, BURLY 1½ TO 3-YD. K-MODELS OUT-MANEUVER SMALLER RIGS . . . OUT-PRODUCE LARGER MACHINES!

Always on top of the heavyweight jobs! Your operator in the cab of a Link-Belt Speeder King-size K-model *knows* he need *never* baby this machine!

He feels the smooth surge of greater *usable* hp through hefty, extra-size shafts, gears and clutches. He socks the dipper in—rugged K-model structural members soak up the shock.

And K-models deliver these output-boosting advantages: Speed-o-Matic, the *true* power hydraulic controls . . . fast, effortless power hydraulic steer . . . *plus* bonus usable hp.

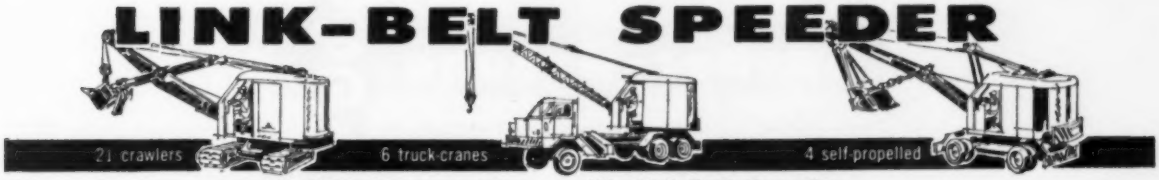
If you'd like more facts demonstrating how King-size K-models (1½ to 3-yd. capacity) outstrip the field, see your distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.



Exclusive centerpin trunnion and oscillating roller design evenly distributes all loadings

The centerpin trunnion is mounted on two stub axles within the upper frame, permitting the upper to oscillate without any of the binding stresses common to other centerpin arrangements. All loadings are thus equalized with no prying action against the centerpin nut or bending stresses against centerpin and its bushing. Working hand in hand with centerpin design principle are the oscillating conical rollers. They are mounted within brackets that oscillate on stub axles, permitting full face contact of rollers with roller path at all times . . . no peening of roller edges or gouging of roller path. 15,231

LINK-BELT SPEEDER



It's time to compare . . . with Link-Belt Speeder

NEW HEAVY-DUTY BARBER-GREENE PORTABLES

Here's an all-new, heavy-duty portable conveyor line from Barber-Greene that's designed to handle sand, gravel, stone, cinders, chemicals, wet concrete, coal and other bulk materials at high capacity and lowest cost. Choose from a wide range of belt widths and lengths.

• **Maximum portability**—Sturdy V-type truck... single oversize pneumatic tires . . . wheels turn on tapered roller bearings. Convenient towing hitch allows unit to be towed over highway or readily moved from one yard location to another.

• **Rugged construction**—Sturdy Warren-type truss design gives maximum strength with minimum weight . . . unit handles large lumps and heavy loads in severest applications with a minimum of maintenance.

• **Easy alteration**—You can lengthen, shorten, alter to meet changing conditions quickly—at any time. Parts are readily available.

• **Choice of three drives—**
Model PA-70 with Torque Arm Drive
Model PB-70 with V-Belt Drive
Model PC-70 with Lineshaft Drive

• **A complete line of portables**—Long, short, light and heavy-duty Barber-Greene Portable Conveyors, plus all conveyor accessories needed, are available to simplify and speed your handling of all bulk materials.

59-5-PO

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.
Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

"Spotty, as a digger, you just ain't got it!"

Without realizing it, Billy has hit upon a basic truth in the excavating business. To come out on top, you've got to use the best equipment for the job.

With many factors beyond a contractor's control, choosing the right equipment becomes especially important. For this is one thing a man *can* control.

That's why so many contractors choose Bucyrus-Erie. They have learned . . . as their fathers did before them . . . that B-E machines are built for more than ordinary digging. They are built to handle the toughest jobs — and still perform better.

BUCYRUS ERIE

NO MAJOR REPAIRS IN 25 YEARS*

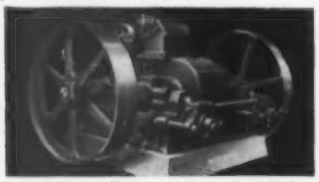
Sturtevant Construction Assures Long Mill Life at Top Loads

Sturtevant crushing and grinding machinery answers the long life top-load production problem for medium to small size plants. Many Sturtevants have been operating above rated capacities for more than 25 years, and *without a major repair.*

"Open-Door" design gives instant accessibility where needed — makes cleanouts, inspection and maintenance fast and easy. Machines may be set up in units to operate at equal quality and capacity.

Jaw Crushers — Produce coarse (5 in. largest model) to fine (⅛ in. smallest model). Eight models range from 2 x 6 in. jaw opening (lab model) to 12 x 26 in. Capacities to 30 tph. All except two smallest sizes operate on double cam principle — crush double per energy unit. *Request Bulletin No. 062.*

Rotary Fine Crusher — Reduce soft to medium hard 3 to 8 in. material down to ¼ to 1¼ in. sizes. Capacities up to 30 tph. Smallest model has 6 x 18 in. hopper opening; largest, 10 x 30 in. Non-clogging operation. Single handwheel regulates size. *Request Bulletin No. 063.*



Crushing Rolls — Reduce soft to hard 2 in. and smaller materials to from 12 to 20 mesh with minimum fines. Eight sizes, with rolls from 8 x 5 in. to 38 x 20 in.; rates to 87 tph. Three types — Balanced Rolls; Plain Balanced Rolls; Laboratory Rolls — all may be adjusted in operation. *Request Bulletin No. 065.*

Hammer Mills — Reduce to 20 mesh. Swing-Sledge Mills crush or shred medium hard material up to 70 tph. Hinged-Hammer Pulverizers crush or shred softer material at rates up to 30 tph. Four Swing-Sledge Mills with feed openings from 6 x 5 in. to 20 x 30½ in. Four Hinged-Hammer Pulverizers with feed openings from 12 x 12 in. to 12½ x 24 in. *Request Bulletin No. 084.*

**Reports Manager W. Carleton Merrill concerning Sturtevant Swing-Sledge Mill at James F. Morse Co., Boston.*

STURTEVANT
MILL COMPANY
104 Clayton St., Boston 22, Mass.

Enter 76 on card, page 177

Washington News

(Continued from page 11)

failure of the Vice-president's trip. If the relationship between the two men were less friendly, this would have been interpreted as a measure for cutting Mr. Nixon down to size.

No doubt, in the months to come, additional opportunities will present themselves for the President to build up his party's position in the public consciousness with little or no expense to his personal popularity. Whether he will learn to do this successfully, as he has learned to do so many other unfamiliar things, remains to be seen. If he does, the Republicans' chance for success in 1960 looks better than it has in many years; if he does not, 1960 may see a battle reminiscent of the 1948 Truman-Dewey campaign, a bitter dog-fight between condidates, neither of whom had the whole hearted support of the party which he was, presumably, leading.

Labor Developments

(Continued from page 13)

elsewhere so that this could not be regarded as an expansion of existing facilities.

Nevertheless, the Court ruled that the construction work was covered by the Federal Wage and Hour Law because it was closely related and directly essential to the subsequent mining operation. As authority for its decision, this lower Court cited the action of the Supreme Court in the case involving the construction of the canal lock.

Thus, the cycle is completed and, without any new legislation, the coverage of the Federal Wage and Hour Law is broader than it was for many years—in the opinion of many lawyers, broader than Congress ever intended it to be.

Indiana Limestone Producers Finance Purdue Experiments

A $12,500 grant has been awarded by the limestone producers of the Indiana Mineral Aggregate Producers Association to the Purdue University agronomy experiment station at Lafayette, Ind. The money will be used for experiments and research covering limestone requirements for forage crops on Indiana soil.

The grant is to be paid in installments over a five-year period. Mulzer Brothers, limestone producers in Tell City, Ind., began the project and financed it until I.M.A.P.A. recently took it over.

Ontario Special Committee To Review Public Land Laws

The special committee set up early this year to make a complete review of the laws of Ontario and other jurisdictions governing the use of public lands for mining and other purposes will hold its first hearings in Peterborough, Ont., during the first week in September, according to the Ontario Department of Mines.

Briefs presented by interested persons and organizations will be considered by the committee when it makes its recommendations for amendments to existing provincial statutes. The committee also plans to hold consultations with officials of other provinces.

Discussions are underway between an American firm, the Texas Gulf Sulphur Company, and the Government of Iraq concerning an offer by Texas Gulf Sulphur to exploit rich sulphur deposits in Northern Iraq, according to the London *Financial Times.*

The safety trophy at Southwestern Portland Cement Company's plant at Fairborn, Ohio, was recently rededicated after employees had completed an accident-free year. The safety award was presented by E. V. Apt, manager of the firm's eastern division.

Laurence C. Mathews has been appointed central Washington representative for the Portland Cement Association. His headquarters will be in Seattle. Mr. Mathews was formerly public works commissioner at Yakima, Wash.

For 50 years Hughes has pioneered every advance in cone-type rock bits

Starting with the first Hughes bit in 1909, that introduced the principle of rolling conical cutters, every major breakthrough in cone-type rock bit design has been pioneered by Hughes.

And for three very significant reasons:

1) A first-hand knowledge of the needs of the industry gained in the field.

2) A continuing research program devoted to improving rock bit performance and drilling techniques.

3) The industry's greatest experience in designing and manufacturing rock bits.

Today, you can look to Hughes, as the industry has for 50 years, for leadership in developing rock bits that will enable you to get maximum performance out of your drilling equipment.

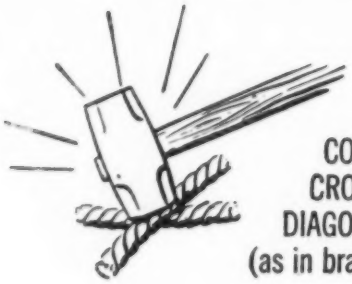
50 YEARS 1909 1959

HUGHES TOOL COMPANY

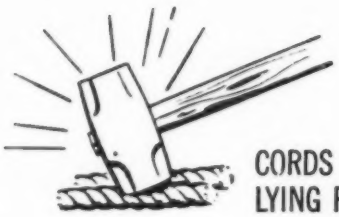
50TH ANNIVERSARY YEAR 1909–1959

ROYAL CORD AIR HOSE

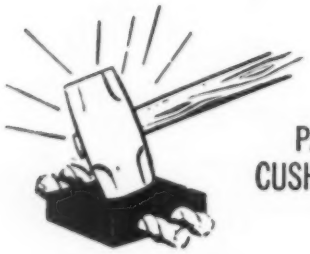
WHICH HOSE CONSTRUCTION CAN TAKE THE BEATING?



CORDS CROSSED DIAGONALLY? (as in braided hose)



CORDS LYING PARALLEL?



OR

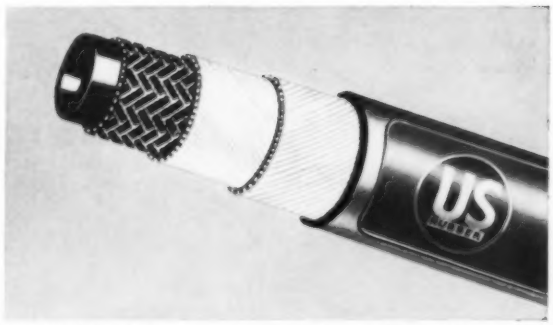
PARALLEL CORDS CUSHIONED IN RUBBER

as in U. S. Royal Cord Air Hose?

Yes, the exclusive "U. S." development—parallel cords cushioned in rubber can take and *do* take the *most* pounding. Observe how the cords run parallel in each of the two pressure-resisting plies; there is no crossing as in conventional braided hose. Each ply is separated by a layer of rubber—each cord is cushioned in rubber. This means there can be no friction created between cords, and therefore no chance of any shearing within the carcass.*

A hose with spiral plies is *always* stronger, because more strands can be used throughout the entire hose length than can be used in other constructions. *U. S. Royal Cord Air Hose has the same construction as that of a tire.* This is the exclusive quality you find under its cover.

The exclusive and outstanding features you get in U. S. Royal Cord Air Hose constitute one of the main reasons why



U. S. Rubber is the largest manufacturer of the widest range of industrial rubber products serving industry.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

**This same exclusive cord construction is also built into "U. S." water, steam, dock and fire hose.*

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Taxes on Interstate Business

A SERIOUS threat to industry which has been developing for several years was recently brought sharply into prominence when the United States Supreme Court upheld the right of states to tax business transacted in them by out-of-state firms. Two later actions by the court have raised serious doubt as to what constitutes interference with interstate commerce by the state taxing bodies.

This subject first made the headlines when the Minnesota supreme court, on a split decision in June, 1957, ruled that an out-of-state firm must pay Minnesota income taxes on the amount of business it does in the state. The court held that the Northwestern States Portland Cement Company of Mason City, Iowa, must pay $102,536 in income taxes, penalties and interest for the years 1933 through 1948. This company had customers in Minnesota and several other states and maintained a sales office in Minneapolis.

The case eventually was appealed to the U. S. Supreme Court which on February 24, 1959, ruled on this and a similar case in Georgia. The decisions hold that net income on interstate operations of a foreign corporation may be taxed by a state, provided the tax is not discriminatory and is properly apportioned to local activities within the taxing state. As a result of these decisions almost all of the firm's interstate business is now liable to taxation. These decisions also eliminated the previous conception that maintaining an office for some specific commercial activity was a prerequisite to taxation by a state. Now order taking on a regular basis by a company's employee is a sufficient minimum contact to support the tax. Thirty-two states now have such tax laws.

In the belief that Congressional action is the only means of saving businessmen from having to pay income taxes to many states and other political subdivisions, where they merely solicit business but in which they maintain no place of business, inventory or warehouse, various groups have urged industry to press for clarifying action during this session of Congress. As a result several bills and resolutions have been introduced in Congress which, although not identical, would accomplish essentially the same objective. Whether or not Congress acts now to correct this injustice, every producer in every state should make it his duty to inform members of the state legislature and the public in general of the unfairness and impracticability of such taxation.

If nothing is done to clarify state taxation of such income, businesses may start getting tax bills from states which had never taxed them before; and it is legally possible that some of these bills may be retroactive, calling for tax payments on sales made years ago. In many cases this would result in double taxation. Even if that didn't happen, the cost of analyzing each state's tax laws, keeping multiple tax records, etc., could in some cases amount to more than the business is worth. There is also doubt that the revenue resulting from the broadened taxing power would greatly exceed the administrative costs of these states in attempting to collect from thousands of small taxpayers.

Walter E. Frauffer

Flexible design for wide variation in deposit

Company Owned Aggregate Plant N. Y. State

ANOTHER ON THE SPOT REPORT

THERE has been for some years a growing trend toward self sufficiency on the part of commercial users of aggregates, especially manufacturers of ready-mixed concrete. At one time only the larger operators in the larger cities could justify this practice, but now it is being done successfully by much smaller operators in areas where demand is less concentrated. One of the latest to take this step is George C. Frey of Lancaster, N. Y., who has ready-mix plants at Lancaster and West Seneca, N. Y. The sand and gravel plant is in Alexander, N. Y.

Mr. Frey, president and sole owner of these companies, has been in the ready-mix business since 1945, starting with a plant in Lancaster, just east of Buffalo, N. Y., and 23 miles west of Alexander. Since then he has expanded considerably and now he has a batching plant at West Seneca, 35 miles west of Alexander. The two operations have a combined output of 1,100 to 1,200 cu. yd. of concrete daily with a fleet of 50 truck mixers of 4- to 8-cu. yd. capacity.

A third batching plant is planned at another location in East Aurora, N. Y., which can be supplied with aggregates from the Alexander operation, or from a gravel washing plant which Mr. Frey plans to construct in Sardinia, N. Y., where he owns and leases sizable gravel deposits.

Mr. Frey has been interested in sand and gravel deposits since 1948 and has been locating deposits for possible future use. The Alexander gravel plant is now supplying all the needs of the West Seneca batch plant, but some of (the Alexander plant's) its output is sold.

The deposit selected is of glacial

This general view of the Frey plant shows the primary crusher and conveyor (right), and the sand screws and their radial stacker conveyors, to the left of the main screening tower.

Helps Supply Needs of Ready Mix Firm

By WALTER E. TRAUFFER

origin and is on Dry Bridge Road in the town of Alexander. Prospecting was done with the company's Sterling earth auger, which drills 12-in. and 8-in. holes, the latter for deep holes. The drill is mounted on an F6 Ford tandem chassis. It is similar to the drills used by utility companies for setting poles but it has a longer boom and can dig to 65 ft. by the use of sectional augers.

The overburden of 2 to 6 ft. is being pushed back by a bulldozer. Later pans will be used. The deposit is on a hill and the overburden will be used to fill in and reclaim this land, which in some instances is too hilly for farming or any other use. Mr. Frey leases eight other sizable deposits in this area, where over 2,000 acres have been prospected.

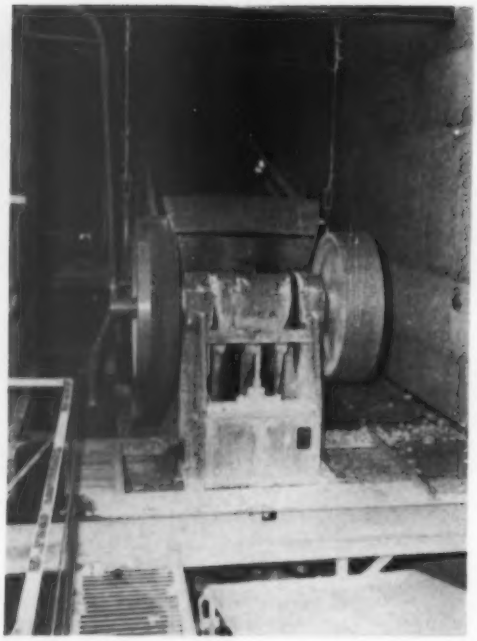
The pit has been developed to a depth of 55 ft. but will be dug down to 65 ft., where a clay bed is encountered. Like most deposits in this part of the state, the deposit has considerable coarse gravel requiring crushing, including some boulders, known locally as "hard-heads", up to 10 and 12 in. Loading is done by a Marion diesel-electric shovel with a 1¼-cu. yd. dipper. Old mixer trucks with 3- and 4-cu. yd. dump bodies are hauling 2,000 ft. from the pit to the plant.

The plant was designed by Mr. Frey with the co-operation of equipment suppliers. It was designed for a capacity of 200 t.p.h. under average conditions and with enough flexibility to take care of the wide fluctuations in the deposit. These can vary from 40 percent sand and 60 percent gravel to 60 percent sand and 40 percent gravel, and there is also variation in the gradation of the sand and of the gravel. Under the best conditions the plant has produced up to 325 t.p.h. and under the worst conditions as low as 150 t.p.h.

This view, showing the shovel loading truck, also shows the nature of the deposit.

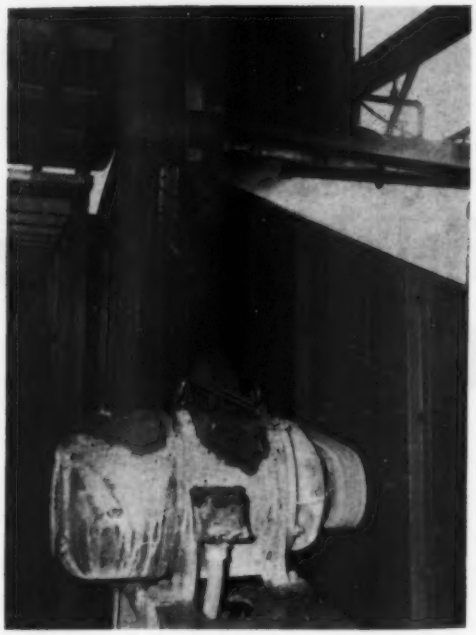
The material is dumped on a grizzly with inverted railroad rails spaced 18-in. on center and supported on cross beams 20-in. on center. There are very few boulders over that size and these are sledged through. Under the 70-ton steel and concrete hopper a Syntron F45 electric vibrating feeder discharges on a 4- by 12-ft. Seco 1-deck scalping screen with 1½-in. heavy-duty wire-cloth. The oversize drops into the Universal 1524 primary crusher, which is set at 2-in. maximum opening. The screen and crusher throughs are carried on a 24-in. by 115-ft. Stone Conveyor belt conveyor to the top of the screening tower.

There preliminary separation or scalping is done by a 4- by 16-ft. Seco 3-deck screen with 1¼-, ½-, and ¼-in. openings. Because of some soft stone, everything over ¼-in. goes to an impact crusher. The minus ¼-in. material goes to



Left: The 15- by 24-in. primary jaw crusher with vibrating feeder and screen above.

Right: The 4- by 16-ft., 3-deck screen which sends all material over ¼ in. to a soft stone eliminator.



the sand processing department.

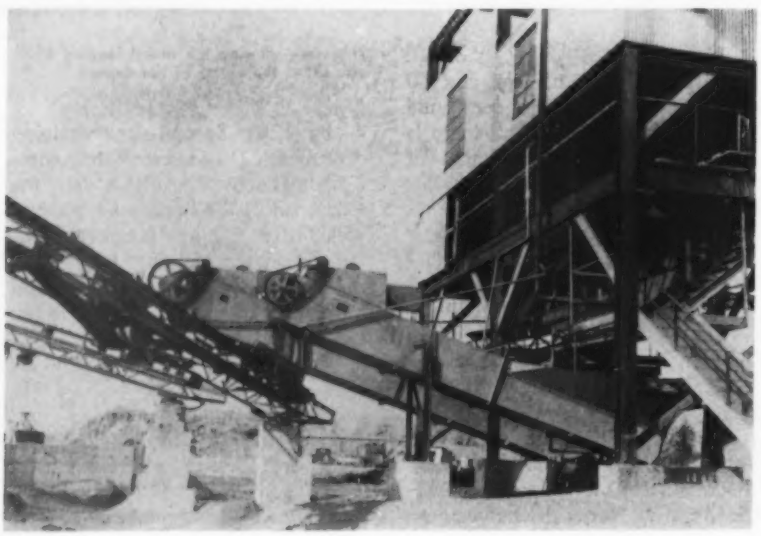
The 36-in. crusher is driven at 1,100 r.p.m. by a 75-hp. motor. It was from another plant and was doing a good job of crushing and eliminating soft stone, but was overloaded beyond its rated capacity. It is now being replaced with a 48-in. Tornado crusher with a 125-hp. motor which is designed for the necessary capacity. An 18-in. by 55-ft. belt conveyor carries the crusher product to the 4- by 12-ft. Simplicity 4-deck final sizing screen with 1¼-, ⅝-, and ¼-in., and 8-mesh openings.

The 1¼-in. plus oversize from this screen is chuted to a pile. A return belt is to be installed later to return this material to the secondary crusher. At present it is trucked back to the deposit and rehandled.

The 1¼- to ⅝-in. (No. 2) gravel off the second deck and the ⅝- to ¼-in. (No. 1) or pea gravel are carried on identical 18-in. by 80-ft. radial stacker conveyors to ground storage piles. The ¼-in. to 8-mesh material through the bottom deck of this screen is No. 1A screenings. This is a byproduct and is being stockpiled and sold as topping for driveways.

Because of the unusually coarse sand being encountered while opening the deposit, the sand processing system is temporarily not being used with its normal flow. The minus 4¼-in. material through the bottom deck of the scalping screen goes to the 24-ft. Eagle Iron Works scalping tank. This has seven power-operated valves and three flumes. Ordinarily two or three of the valves would be used for concrete sand and the others for masons sand. At present all of them are feeding a perfect concrete sand to a 44-in. diameter by 32-ft. Eagle screw classifier and dewaterer. This unit is at present being run at half speed for full recovery of fines, and as a result a very clean concrete sand is produced.

The minus 8-mesh material through the bottom deck of the final sizing screen is now the sole source of masons sand. Later this will be supplemented with some of the sand from the scalping tank. These throughs are flumed to a settling box with baffles which overflow the excess water to a waste pipe. The sand



The scalping tank from which sand goes to the screws and the radial stacker conveyors (left).

goes to a 36-in. by 25-ft. Eagle masons sand screw.

The two sands are stockpiled by two 18-in. by 80-ft. radial stacker conveyors. These and the two gravel stackers are mounted individually on two 8¼- by 20-in. truck tires on a track on 37-ft. radius concrete footings and are self propelled by ½-hp. motors. These conveyors swing through an arc of 45 degrees. The gravel conveyors discharge from a height of 38 ft., and the sand conveyors from 32 ft. to stockpiles. These stackers were designed by Stone Conveyors of Honeoye, N. Y., who also supplied all belt conveyors. By moving them occasionally, segregation in stockpiling is largely eliminated.

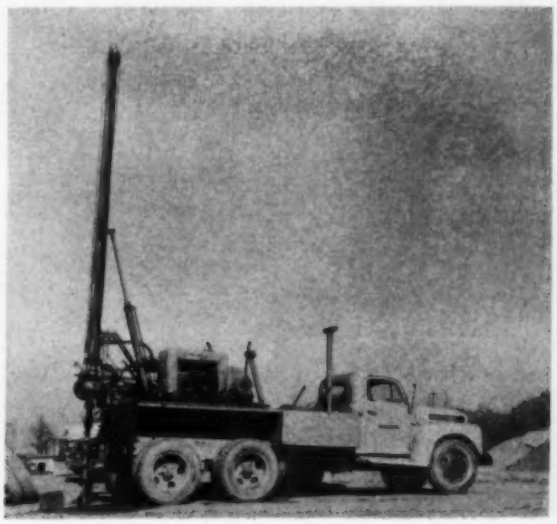
Material is loaded from the stockpiles into trucks by a 2½-cu. yd. Pettibone-Mulliken Speedall front-end loader. A Bucyrus-Erie 22B shovel is also used for this work. All truck shipments are weighed on a 45-ft. Toledo truck scale with Printweigh attachment.

Wash water for the plant is supplied from an artificial pond by a 6- by 8-in. Gould pump driven by a 100-hp. motor. This delivers 1,200 g.p.m. at a pressure of 45 lb. at the screens. Both screens are equipped with Chain Belt Rex spray nozzles.

Overflow from the scalping tank and the two screws goes to an artificial pond or sump, from which the overflow is pumped by a 5- by 4-in. Wayne pump to the fresh water pond; and the only overflow to a stream is from its far end. A 4-in. dredge pump was being used to transfer settlings from the sump into swamp land on the property. This has been eliminated by increasing the sump area size.

The plant uses 440-v., 3-phase, 60-cycle electric power from the power company's transformers. All plant equipment is controlled from a room at the top of the screening tower. The control panel was completely built and hoisted into place. Starting is by pushbutton. Automatic sequence stopping is a safety factor.

The final 4- by 12-ft., 4-deck screen from which two of four products go to the radial stacker conveyors.



The truck-mounted earth - auger - type drill used by the company for prospecting deposits.

Moro Gravel Company Contracts for Barge Shipping

Two new firms, the Moro Gravel Company of Warren, Ark., and Arkansas Towing Company of Calion, Ark., have signed a barge shipping contract for towing 220,000 tons of gravel annually on the Ouachita River.

The Moro Gravel Company was organized recently to furnish gravel for the new super-highway paralleling U. S. 80 east and west through Louisiana. Gravel from pits in lower Calhoun County will be trucked to Morobay, Ark., and shipped by barge to West Monroe, La., for delivery to this highway operation.

Including a $500,000 carryover, Canada Cement Company's capital expenditures for 1959 are estimated to be $3,000,000. The firm has an installed capacity of 24,000,000 bbl., more than half the Canadian total of 40,000,000 bbl. A $100,000,000 expansion program has almost doubled the firm's capacity in the last 10 years.

The Development Loan Fund recently issued a $35,000,000 package loan to India, of which $5,000,000 was for equipment to expand India's privately owned cement industry.

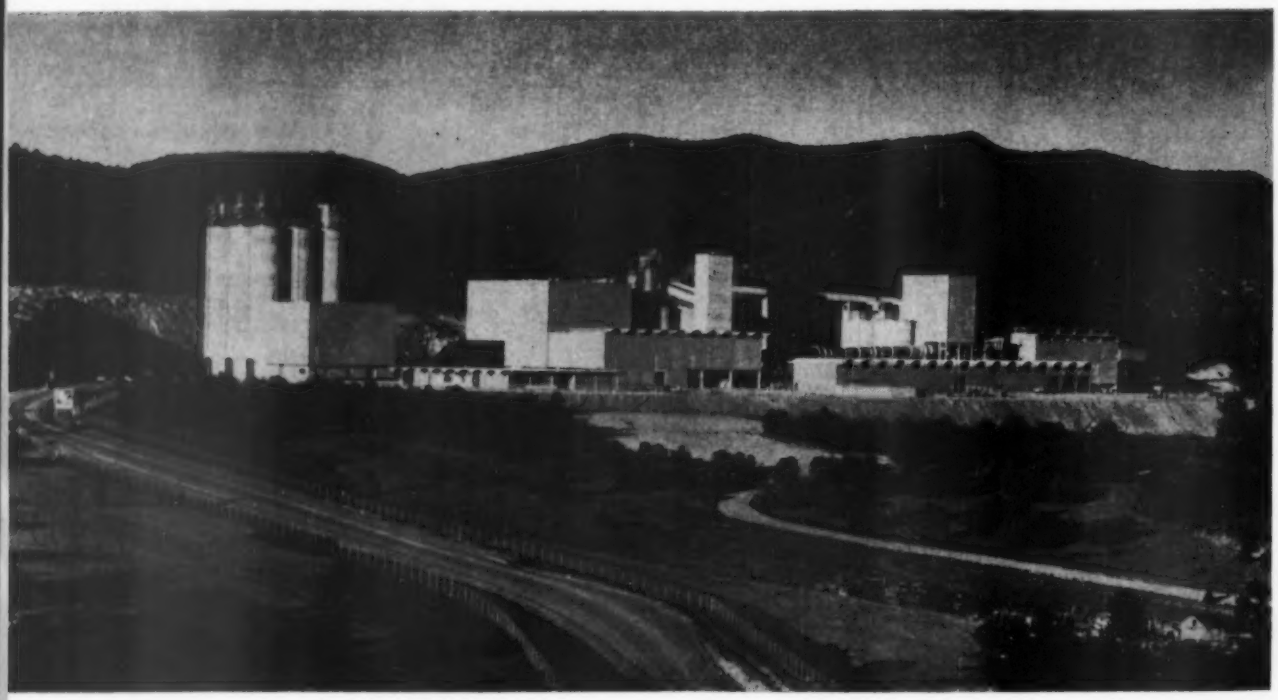
More than 100 years ago, this primitive kiln was producing lime in Tijeras Canyon. . . .

. . . . Today, the locale is the site of this outstanding example of modern production technology, the first cement plant in New Mexico.

IDEAL forges new

WITH the formal dedication in mid-June of Ideal Cement Company's new $14,000,000 mill at Tijeras, New Mexico, a significant milestone was reached in the expansion plans of both the state and this leading cement producer.

The new Tijeras plant, located about 16 miles east of Albuquerque, is the first cement producing facility to be built in New Mexico. It also represents an important and integral part of Ideal's 10-year,



Tijeras mill, first in New Mexico, also an attractive showcase for architectural concrete

link in chain of 16 plants

$176,000,000 expansion and modernization program that was initiated in 1955—a program designed to increase company-wide annual capacity from 22,000,000 bbl. to 40,000,000 bbl. by 1966. With the Tijeras mill now in operation, a capacity of 34,000,000 bbl. has been reached.

Befitting its importance in Ideal's plans and to the area it serves, the plant displays a number of impressive and unusual features. It was designed to produce over 1,000,000 bbl. a year with one of the most highly instrumented systems in the industry. Every production phase, from the quarry to finished product storage, is controlled from a single centralized control room.

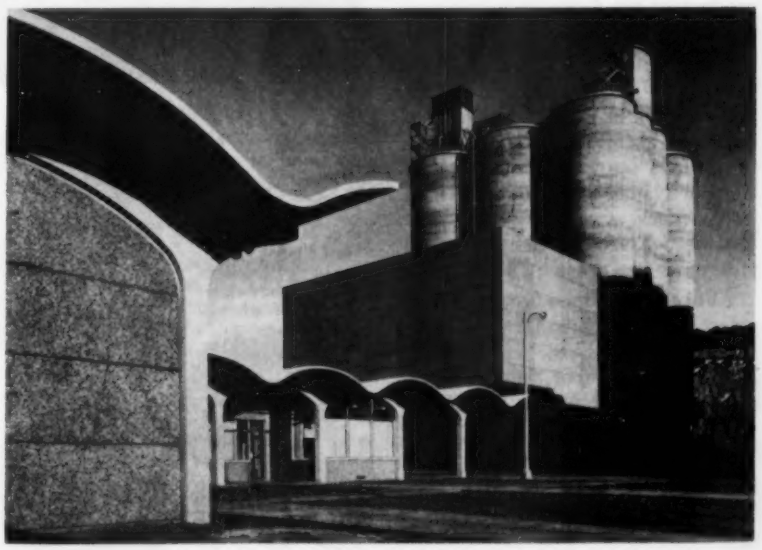
The plant's construction is also testimony to progressing technology in concrete architecture. More than 70,000 cu. yd. of concrete were placed—in the form of precast curving roof slab and mosaic panels; prestressed, precast beams and columns; paving; and even light poles and fence posts.

Basic components among the various units of high-capacity equipment are the two 11-ft. 6-in. by 17-ft. 1,250-hp. Allis-Chalmers mills — one a raw grind, and the other a finish mill—and the 375-ft. kiln, also supplied by Allis-Chalmers. At the feed end, the gas-fired kiln is 12 ft. in diameter for the first 50 ft., and 11 ft. in diameter for the remaining length.

A unique feature of the mill is found in the kiln exhaust filtering system which involves 1,280 glass cloth bags containing more than two acres of glass cloth. The bags, supplied by Coast Manufacturing and Supply Company, are 11½ in. in diameter, 25 ft. long, and designed to withstand temperatures in excess of 600 degrees F. The filter system was designed by Ideal's engineering department, and it eliminates the need for a stack. It is perhaps the most elaborate of the 33 different dust collection systems installed at strategic locations throughout the operation.

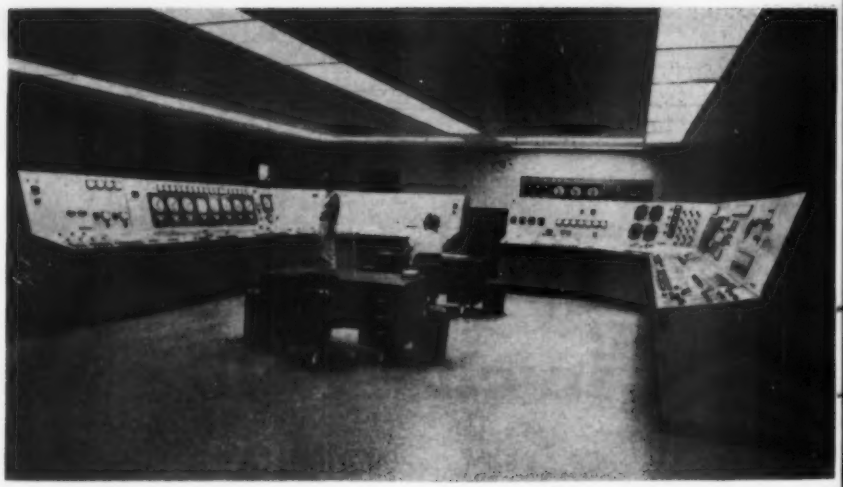
In normal operations, the kiln department is expected to consume approximately 3,500,000 cu. ft. of natural gas every twenty-four hours. During the same period, power consumption will be about 76,000 kw., meeting the requirements of nearly 400 motors. To supply the motors and service lines, more than 300 miles of electrical wiring were installed.

Storage and loading of cement is accommodated in a group of nine silos (plus four interstice bins), and an adjoining packhouse equipped with three St. Regis baggers. The silos were constructed by the slip-



Composition in concrete. Versatile application of the plant's product is evident in these precast curving roof slabs and mosaic panels (left). In addition, precast prestressed columns and beams were used throughout, and the silos were raised by the slip-form method.

Centralized control . . . . of every production phase from quarry to finished product storage.



form method to a height of 134 ft., and have a capacity of 169,000 bbl. They are elevated to provide a truck drive-through below each line of three. A 140-ft. long platform truck scale is installed in each drive-through. All shipments, bulk or bag, are made by truck.

Limestone for the Tijeras plant is obtained in a quarry a short distance from the plant. More than 100 years ago, Tijeras canyon had been the site of a primitive lime kiln—long since abandoned—where this top quality material was first processed into mortar.

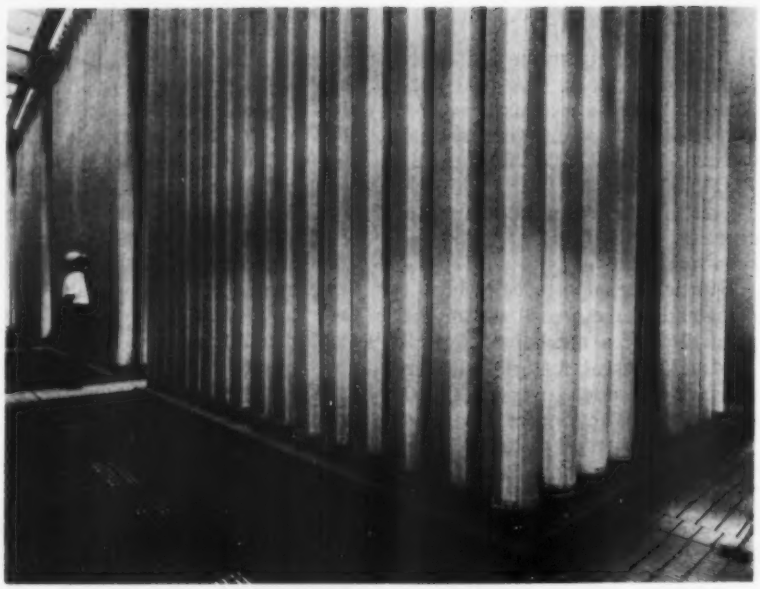
A 2½-cu. yd. Marion electric shovel is used to load out the rock after drilling and blasting, and the material is hauled to the plant hopper in 15-ton Mack trucks. Primary and secondary reduction to a top size of ⅜-in. is accomplished with a Cedarapids double impeller impact breaker, and a Williams impactor, respectively. The sized mill feed is then transported by conveyor to four raw material silos.

In the raw mill circuit, the mill is closed-circuited with a 16-ft. air separator-dryer *via* screw conveyors and bucket elevator. Feed is drawn from the silos on Feedoweights and delivered to the separator for drying before entering the mill. The product of the latter is transferred by a Fuller-Kinyon pumping system to a group of four 4,000-bbl. blending silos.

Blended kiln feed is drawn from the silos by screw feeders, and transferred in a screw conveyor, bucket elevator system to a Fuller constant head feeder. From this point the feed is delivered to the kiln feed pipe on a Feedoweight.

Clinker discharged from the kiln enters a 6- by 85-ft. Allis-Chalmers cooler which, in turn, discharges to a vibrating conveyor, bucket elevator, and belt conveyor system on which the material is transported to four clinker storage and finish mill feed silos.

The finish mill, closed-circuited with a 16-ft. air separator, is fed from the clinker silos by Feedoweights and vibrating conveyor. From the separator, the finished



Above: More than two acres of glass cloth . . . . in lieu of a stack. There are 1,280 glass cloth bags in the kiln exhaust filtering system, designed to withstand temperatures in excess of 600 degrees F.

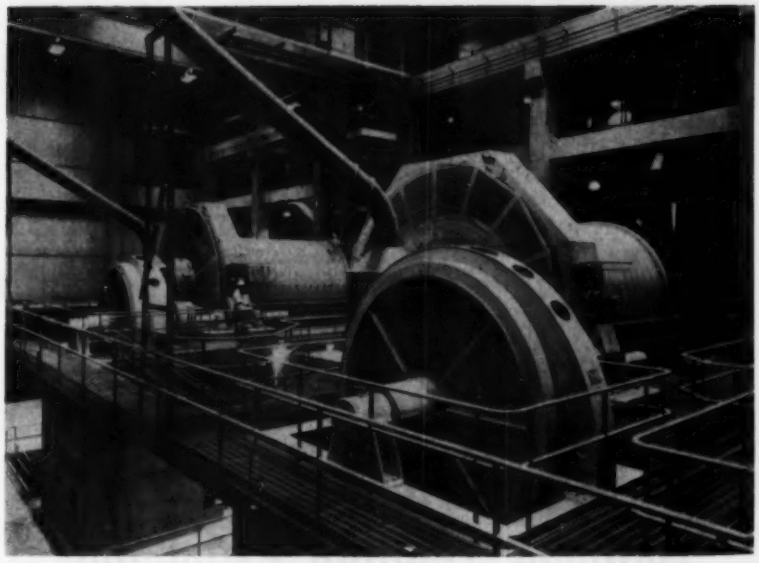
Right: Firing of the 375-ft. kiln is expected to consume 3,500,000 cu. ft. of natural gas every 24 hours.

product is pumped in a Fuller-Kinyon system to the cement storage silos described previously.

With this modern, efficient facility, Ideal has strengthened its long association with the construction industry in New Mexico—an association in which the company has been supplying needs in the northern part of the state for more than half a century from operations in southern Colorado.

The Tijeras plant is also an important link in the chain of plants —now 16—and four terminals with which Ideal serves an area between Mobile, Ala., on the Gulf Coast to Seattle, Wash., on the Pacific Coast.

Much of the responsibility for the design and construction of the New Mexico facility was in the hands of George Wiley, chief engineer of Ideal. Heading the new operation is Robert H. Biggs, plant manager.



Identical units, the finish mill (left) and the raw mill (right) are driven by 1,250-hp. motors. The mills are 11 ft. 6 in. in diameter, and 17 ft. long.

6-Mo. Construction Contracts Set New All-Time Record

Construction contracts in the first half of 1959 set a new all-time record for the period, with large increases in residential and non-residential building categories offsetting declines in heavy engineering, according to F. W. Dodge Corporation. In a midyear review, Dodge economists said that the most significant feature of the period was the strength showed by the private sector of the industry, which rose sharply despite a drop in government projects.

Noting that Dodge seasonally adjusted index of contracts had risen to very high peaks in the middle of 1958, then declined in the winter, and is now rising again, the report said:

"The peak in the middle of 1958 was very largely the result of government stimulation of housing and highway activity as an anti-recession measure. Perhaps the best feature of the first half of 1959 is that contracts have risen to almost the same level without the benefit of special government stimulants."

Other key developments noted include: a "phenomenal recovery" of contracts for factory buildings, after a slow start, with June contracts running 89 percent ahead of June, 1958; continued strength in housing throughout the period, with no signs of a decline despite tightening money; a fairly sharp drop in highway contracts below last year's levels, which was expected because of the large amount of activity last year in special anti-recession programs; "unexpected strength" in commercial buildings, with store buildings strong all through the first half and office buildings showing an upturn in the last two months.

Work has been started at the Jones marble quarry near Williams, Oreg., by Pacific Northwest Lime, Incorporated, a newly formed corporation. The owners include Mr. and Mrs. Mabry Ogle, and Gene L. Brown, attorney of Grants Pass. Road improvements have been made, and drilling has begun for blasting down rock. Plans include production of stone for the paper industry, agricultural lime, and possibly building stone.

A violent, 11-week strike at the Virginia-Carolina Chemical Company, Mulberry, Fla., collapsed recently in the face of a company ultimatum to the workers to return to work on the next Monday or be replaced.

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Quarry-run stone discharged into this hopper is transferred on an apron feeder into cable-cars for transport up an incline to the top of the plant.

Haulage, Drilling Efficiency Improved at Anna Quarries

NEARLY a half-century of operation has not lulled the management of Anna Quarries, Inc., Anna, Ill., into a complacent attitude, nor put them in a rut. This 300-t.p.h. plant, one of the largest in southern Illinois, has from time to time undergone expansion, revision, and it has been equipped with the most efficient operating units available in terms of progressive industry technology.

The latest step in the continuing improvement program involved quarry and plant feed operations. In view of its many years of operation, the quarry is now 150 to 175 ft. deep —a circumstance that has made it uneconomical and inefficient to attempt to maintain uninterrupted quarry haulage from shovel to plant *via* trucks or similar equipment. Therefore, a steeply inclined cableway with counterbalanced rail cars has been used for some time to haul quarry-run stone from a hopper at an intermediate quarry level to the top of the plant.

Within the last ten years the company has acquired a number of 6-cu. yd. (9-ton capacity) model 60 Koehring Dumptors. Last year, due to further deepening of the quarry, the hopper and cable-car feeder were moved down another 50 ft., and the cable-car rails were extended downward to the new location. At that time experiments were conducted with various models of end-dump trucks hauling from the shovels to the hopper in the interest of gaining haulage capacity.

In this case, none proved to have the speed and mobility required to negotiate the 20 percent grades necessitated by the relatively confined area, and the limited room for maneuvering at the hopper ramp. The latter, in particular, focused the attention of management on the potential of the newer model 100 Koehring Dumptors, which with pivoting seats and dual steering wheels and controls, permits the driver to operate in either direction with ease and speed.

Two of these units were acquired early this year, and put to use in widely separate sections of the operation. One joined the five older smaller-capacity machines in the quarry, and the other was left on the top for stockpile rehandling. With the addition of sideboards on the flared sides of the dump body, the capacity of the latter unit has been increased even further. It has also been used as a "dozer" for leveling stockpiles.

In another phase of the overall quarry operation, increased drilling efficiency has been realized with the recent acquisition of an Ingersoll-Rand Crawl-Ir blast hole drill. This equipment, which pulls its own compressor, has replaced two old wagon drills, and has cut related labor cost about 75 percent.

Blasting operations are carried out daily at the end of the shift. The next morning the broken rock is loaded into the Dumptors by a pair of 1½-cu. yd. shovels operating on separate ledges. The haulage units transport the material up a series of ramps to the hopper, where they discharge *via* free fall gravity dump, (older machines), or by either free fall or controlled gravity dump on

(*Continued on page* 96)

One of the new haulage units being loaded by a 1½-cu. yd. quarry shovel. Another shovel operates on a separate ledge in the 175-ft. deep quarry.

By C. E. GOLSON
Manager, Sales Department
Aggregate Beneficiation
WEMCO Division, Western Machinery Co.

Modern classification methods

applied to fine aggregates

Part II

A-3. Velocity Classification—Recovery by Conveying Devices The problem of designing equipment to deliver a dryer sand than could be obtained from a bottom-unloading classifier, led to the scheme of separating the two phases of classification in order to obtain greater efficiency in each. Such a device calls for settling to be carried out in a tank designed to provide maximum quiescent area, maximum weir length to reduce overflow velocity, and sufficient depth so that sand could accumulate without disturbing the pool.

Excavation of this settled sand could be carried out by any materials-handling system, but in order to effect drainage and to squeeze the water out of the voids in the sand mass while least disturbing the pool only three methods have been found: the drag-conveyor, the archimedean screw, and reciprocating rakes. These three conveyors are used to elevate the sand along an inclined drainage deck to a height well above that of the pool, allowing entrapped water to flow back to the pool.

(a) The drag conveyor had been employed in the metallurgical industry, where it was known as the Esperanza classifier. It consisted at first of a wooden tank and an inclined drainage deck. The excavating and conveying was done by means of angle-iron flights mounted on an endless belt, the tight side being used to perform this service. To keep the bearings of the tail-pulley out of the slurry, and still bring it within working range of the bottom of the pool, a large-diameter pulley was necessary. (Figure 14) The limitations were obvious: width of drainage deck and drag-belt were limited by mechanical requirements; depth of flights, hence volume of sand conveyed, was limited by slippage of the sand on the slope of the deck. But most serious, the displacement of liquids in the pool caused by the large pulley and the descending portion of the belt, even at low speeds, roiled the pool until orderly settling was just about impossible.

The first improvement was to replace the belt with chains (Figure 15), and the pulleys with sprocket wheels. This improved the settling conditions in the pool and increased the weight of sand which could be handled by the drag-conveyor. The second, and major, improvement was an application of the methods used in bucket dredges: using the slack side of the conveyor for excavating and conveying. This resulted in a further improvement in the settling conditions of the pool since it was then possible to raise the lower sprocket above the level of the pool.

The roiling effect of the descending chains and flights cannot be avoided and is, perhaps, the greatest obstacle to full efficiency of this type

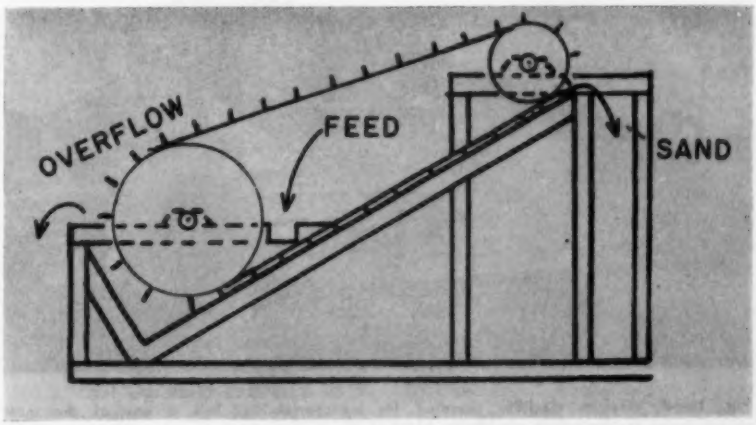


Fig. 14—A sketch of the Esperanza type drag belt classifier.

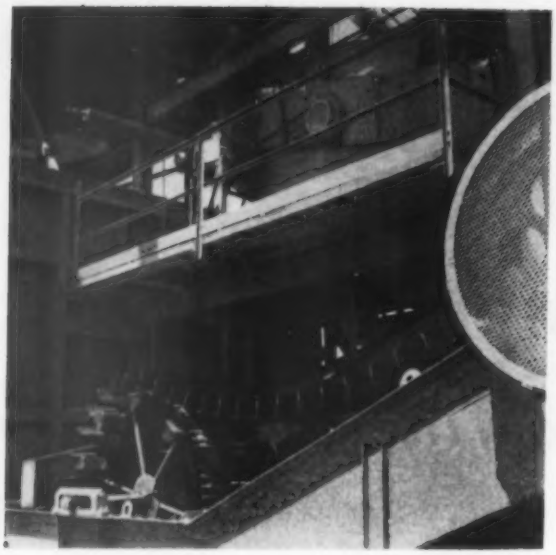


Fig. 15—The drag classifier with the belt replaced by a chain and the solid pulley by a lagged hollow wheel, but using the taut side to excavate and convey.

Advantages — Drag-classifiers —	Disadvantages
1. Low moisture content of delivered sand	1. Classification at separation size only
2. High recovery at separation size and larger	2. Turbulence due to descending chain and flights
3. Lower power requirements	3. Floor space and head-room requirements
4. Easy to operate	4. Inability to handle variations in feed
	5. Initial cost
	6. High maintenance cost due to abrasion of moving parts
	7. Necessity of maintaining tension on drag chain

Fig. 16—A Mockum classifier mounted for transportability. This is one of the most recent types of chain-drag classifiers. Most of the modern sand drag classifiers use chain-and-sprocket wheels and the slack side for excavating and conveying.

of classifier. Continued submergence and emergence of the chain and spocket wheels in the abrasive slurries results in high maintenance costs.

There are many variations from the basic design—in the shape of the settling tank, differing locations of the feed inlet and of the overflow weir, and various slopes of the drainage deck. Characteristics and capacities of the machines will vary with these designs; but the principal features remain: ability to produce a sand containing virtually all of the material at the separation size or larger, and containing a small amount of entrapped moisture. (Figure 16) (Note the comparison below, left.)

There are quite a few of these machines in use, some singly, but usually in series to handle varying specifications.

One of the most recent improvements, although its applicability to the aggregate industry is still to be determined, is that of the Overdrain classifier. (Figure 17) It combines several features in one machine: a modified hindered settling zone, where the feed is forced downward in a rising current of water; a standard velocity classification zone; and, along the drainage deck, a series of hindered settling compartments with the slimes and undesired fines forced out through perforations in the belt and short-circuited directly to the pool. There are not enough applications of this machine in the aggregate industry to evaluate it adequately.

(b) The Archimedean screw has been used since antiquity as a water elevating device. Its application to the problem of elevating from the classifier pool and conveying a wet sand, with many properties of a liquid, was logical. By changing the design of the flights and of the trough or deck on which it works, drainage of the liquid portion of the slurry could be easily provided for. The use of this spiral has several advantages over that of the drag-conveyor:

1. Turbulence caused by the rotation of the flights where they penetrate the settling level of the pool is much further back from the weir overflow, and is less violent

than that caused by a downward moving chain-conveyor.

2. The sand being elevated is turned over repeatedly, compacted, and "kneaded," with greater removal of the water entrapped in the interstitial spaces.
3. Slippage of sand on the drainage deck is reduced by the proper design of the pitch of the screw, which in turn allows for multiple spirals at closer intervals and moving more slowly.
4. Where drainage might be hampered in solid flights, the use of ribbon spirals allows excess water squeezed out of the sand to flow back freely to the pool. In one type the ribbon is mounted on the shell of a revolving tube. (Figure 18)

Although many models use a stationary lower bearing outside the tank, some modern designs use a grit-proof submerged bearing, which in turn has allowed the entire spiral to be raised or lowered to control agitation in the pool in order to meet different specifications of sand. The problem of sanding up is solved by raising the spiral out of trouble and allowing it to work its way down progressively, thus reducing the requirement of extra strength of moving parts and of power to start up a buried spiral. (Figure 19)

Variations in design, although many, are mainly concerned with the location of the feed entry, the configuration of the pool area, and the pitch of the screw. The variations have resulted in the use of slower, multiple ribbons, with a saving in power and wear for the same raking capacity. In all cases, however, the sand delivered by a spiral or screw classifier contains the minimum amount of entrapped water which can be obtained by modern classification methods. Proper design will allow the recovery of solid particles even finer than No. 200 sieve. (Figures 20, 21, and 22) (Note the comparison at the right.)

(c) Use of the raking device as a means of recovery. This conveying device is different from conventional material conveying mechanisms. When the thickener was introduced into metallurgical practice, it was found that the sand delivered to a sand leaching plant still contained an appreciable amount of entrained slimes and water. In order to meet the requirements of a cyanide leach, these had to be eliminated. This led to the first of a long series of rake classifiers. The word rake is used advisedly since the motion is very

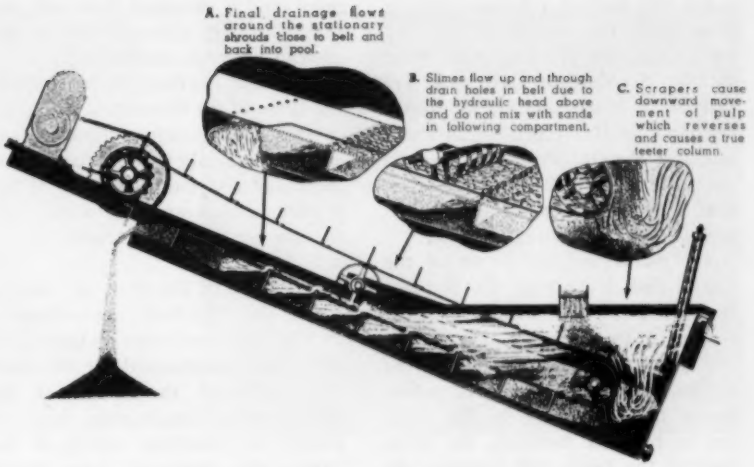

A. Final drainage flows around the stationary shrouds close to belt and back into pool.
B. Slimes flow up and through drain holes in belt due to the hydraulic head above and do not mix with sands in following compartment.
C. Scrapers cause downward movement of pulp which reverses and causes a true teeter column.

Fig. 17—An operating diagram of the overdrain classifier.

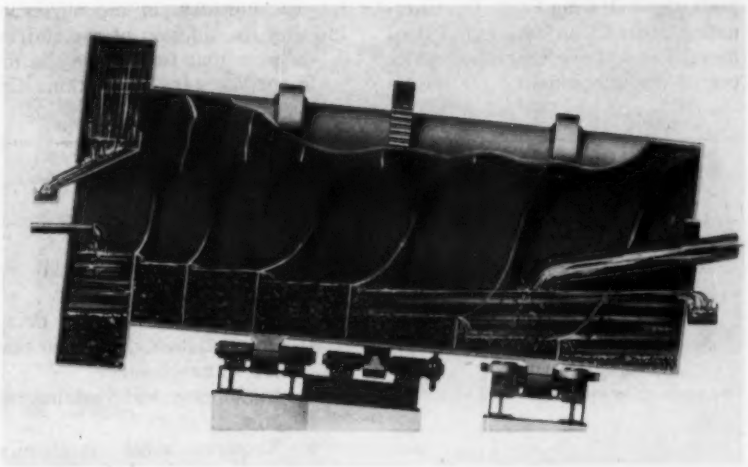


Fig. 18—A counter-current classifier. This is an Archimedean spiral inside a revolving cylinder.

Advantages — Screw-classifiers —	Disadvantages
1. Low moisture content of clean, sized sand product	1. Large size of pool required for very dilute slurries, with screw overcapacity for sand
2. Low cost of operation and maintenance	2. Floor space and head required
3. Ease of adjustment to fit varying product requirements	3. Initial cost
4. Large raking capacities when required	

much like that of a farmer using a hand rake. The blades of the rake move along the drainage deck when pushing the sand upwards, and are lifted clear of the sand on the drainage deck on the return to the lower position. Penetration of the rakes in the pool is far back from the weir, thus eliminating one of the main disadvantages of the drag-classifier.

By increasing the depth of the flights and decreasing the distance between them, the sand-moving capacity of the classifier can be increased while the frequency of the reciprocating motion of the rakes, hence the turbulence in the pool, can be reduced; however, the wider face of the rakes will increase the turbulence. Since the sand on each flight is allowed to slip back before it is caught up by the next forward push of a following flight, this alternating compaction and slump does move some of the entrapped water out of the interstitial spaces, and a drier sand is obtained than with the drag-classifier, although not as dry as with a spiral-classifier.

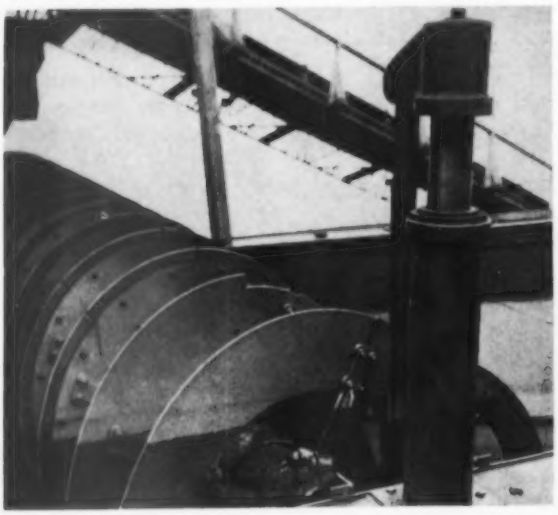
This slippage does, however, limit the slope of the drainage deck, since to prevent excessive slippage, the speed of the rakes would have to be increased and the turbulence of the pool increased as well, with a reduction in the effectiveness of the settling pool.

Succeeding changes in design from the original rake-classifier to that used nowadays (Figure 23) have been mechanical for the most part, although the design of the reciprocating mechanism has allowed for smoother action of the rakes, and increased their raking capability. Although these classifiers are used for a combination of hindered and free settling in the metallurgical industry, in the aggregate industry the dilution of the slurries is so great that free settling is the main method of classification. The downward movement of the rakes in the pool will cause some downward currents in the pool, much as in the case of the drag-classifier, with more slimes in the sand than is usually the case with screw classifiers. Finally, the mechanism is somewhat more intricate, and costlier to operate and maintain than that of the preceding two types of conveying-classifiers. (Note the comparison below, left.)

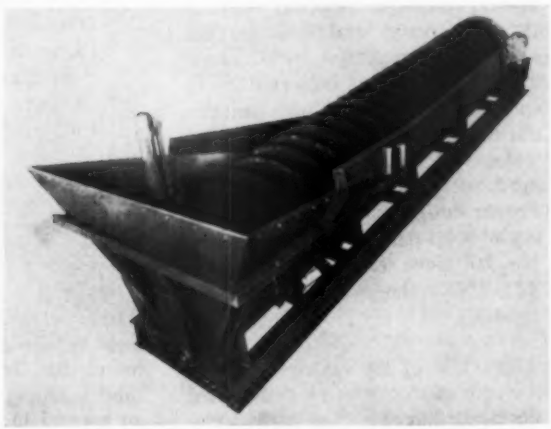
This excellent and efficient machine is not used as much in the aggregate industry as it is in the metallurgical; some of the disadvantages listed in the comparison may be an explanation.

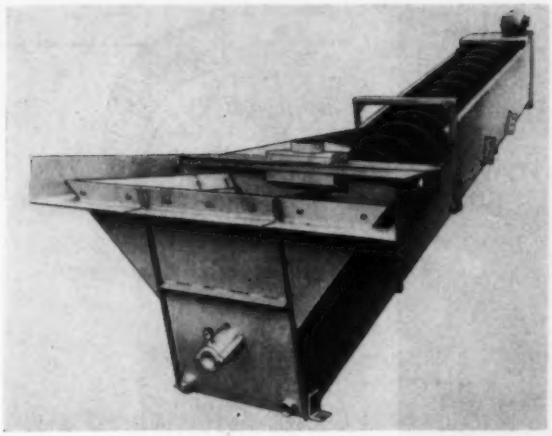
Advantages	— Rake-classifiers —	Disadvantages
1. Classification device		1. Large size of pool required for dilute slurries
2. Large raking capacity where required		2. Floor space and head required
3. More efficient dewaterer than the drag-classifier		3. Less slope of drainage deck
		4. Less efficient dewaterer than the screw-classifier
		5. Initial cost and maintenance cost
		6. Requires more mechanical operation

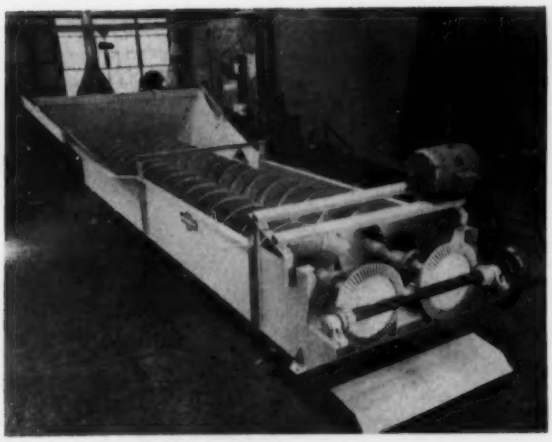
A-4. Velocity Classification—Recovery by Scooping Out of a Current These machines are used more for the dewatering of sands than for their classification. Their design varies, but no provision is made for a settling pool; in all cases it is by a change in the direction of the flow of the slurry, or by impingement on the excavating device that the separation between solid and liquid is made. The classification is therefore extremely rudimentary, and only in rare cases are these devices used to meet modern specifications. Their effectiveness as a scrubber is somewhat higher, because of the violent changes in direction, and the consequent attrition of soft coatings on sound sand.



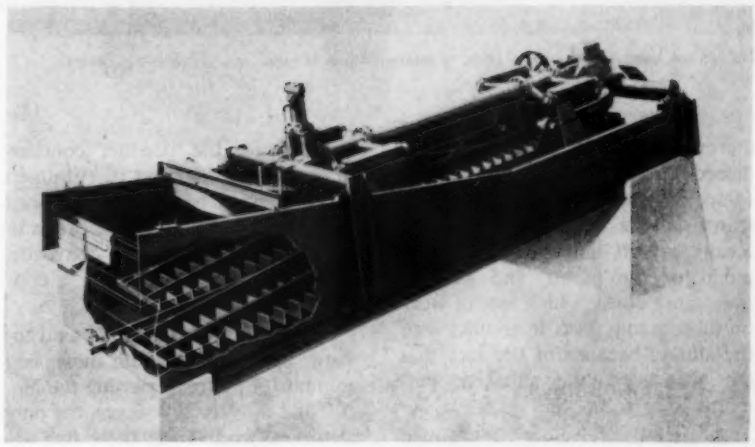
Left: Fig. 19—A hydraulically actuated shaft lifting device, with a sealed submerged lower bearing. Below: Fig. 20—A WEMCO sand preparation machine.







Above, left: Fig. 21—A single-screw spiral classifier with the feed entry in the pool area and with a fixed water-lubricated bearing. Above, right: Fig. 22—A duplex screw washer-classifier. Note the details of the design and drive.



Above: Fig. 23—The modern Dorr classifier (HX). This is the latest of many developments in rake classifiers.

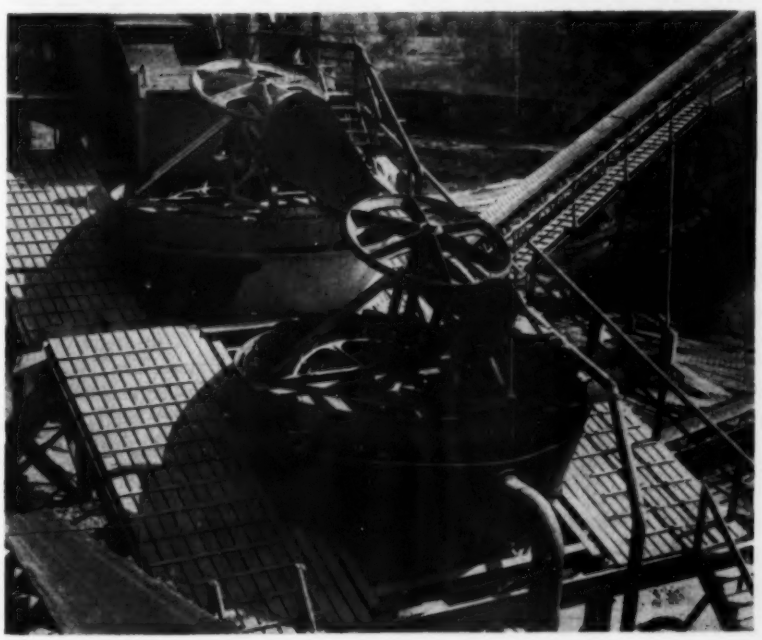
There are many types of these machines, some home-made, but three are typical of the general trend:

The sand washer (Figure 24) is typical of the horizontal type, with the material flowing against the scoops, and being scraped up an inclined deck to a point of discharge, while the liquids overflow the weir along the low side of the inclined tank.

The sand-wheel (Figure 25) is used to dewater sand in some cases, and could be considered as representing the vertical group of sand dewaterers.

Finally, the use of bucket elevators to reclaim settled sand from a boot or pit is still used in some cases.

B. Accelerated Settling Devices Many improvements have been made over the basic design of the cyclone since its first use in the field of aggregate classification. The principal reason for these improvements has been the requirement of high velocities in order to obtain



Right: Fig. 24—These 12-ft. sand washer units, used in a Midwestern plant, handle 180 t.p.h.

Fig. 25—A sand wheel with a 14-ft. diameter, which is used as a dewatering device.

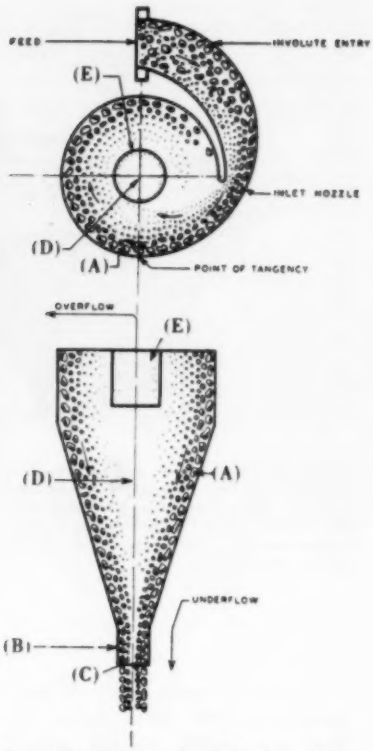


Fig. 26—A diagram of a hydraulic cyclone, showing classification and flow of materials.

the cyclonic effect. This in turn required high inlet pressures, which (since only pumping will deliver the slurry at the required pressures) means a high horsepower requirement for the pump, and what is even more costly a high rate of wear on those pump parts in contact with the slurry, because of the fact that the slurry contains abrasive materials.

A great improvement is claimed in the replacement of the tangential feed entry by the involute feed entry, since pre-orientation of the slurry into its circular path, even before it enters the cylinder, would result in a reduction of pressure requirements at the feed entry. It has a further advantage in that the area of the feed entry is much larger, and the relation of orifices can be maintained with cylinders of smaller diameter. (Figure 26)

Modifications of the discharge orifices to add a suction effect are claimed by some manufacturers to add to the efficiency of the cyclone. However, it would appear that introducing this extraneous element may change the characteristics of the separation phase by disrupting the force pattern, and that added recovery of the product may be effected at the expense of the sharpness of separation. (Figure 27)

In any case, none of the cyclones now in operation is capable of absorbing large variations in either gallonage or tonnage of feed; and, furthermore, the product contains an appreciable amount of entrained water. It must be further processed by a dewatering device in order to be handled on a belt conveyor, stacked, or used directly in a concrete mix.

As modern specifications tend towards finer consists, with increasing amounts of matreial passing the No. 100 and the No. 200 sieves, the only method of recovering these fine aggregates from the average washing process was the use of classifiers with extra large pools, all the more so since we were dealing with materials below the "critical velocity" with a lower rate of fall. The cyclone has brought an economical and efficient method of stripping desired fines from what was considered, only a few years ago, a waste material. (Figures 28, 29, and 30)

C. Hindered Settling Devices Although there are many areas in some of the classifiers here described in which hindered settling conditions prevail, the use of this method as a sole means of classification in the aggregate industry is not too common. There are several reasons for this fact: the aim of hindered settling is to obtain much sharper size separations than is required by fine aggregate specifications; the inherent conditions which govern hindered settling have kept these devices to small capacities; operation of even the semi-automatic hindered settling classifiers requires close supervision, and hence they are costly in man-power requirements.

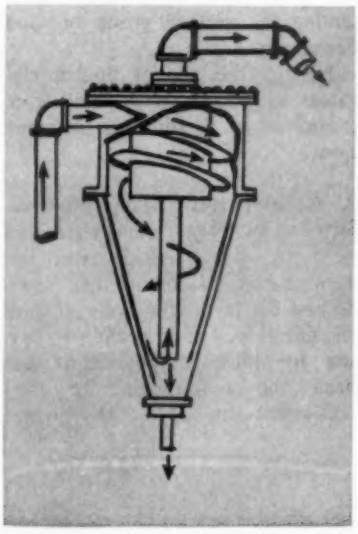
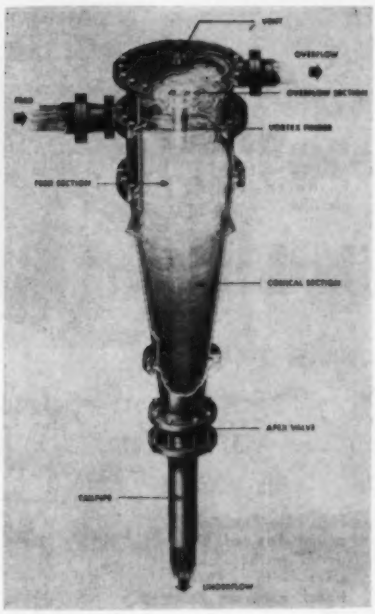
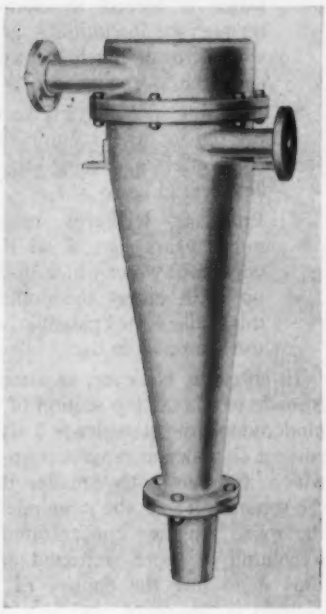


Fig. 27—The Whirlcone, a hydraulic cyclone with a syphon on the underflow and an extension of the vortex-finder.





Above: (left) Fig. 28—The Sandclone, with involute feed entry.
(middle) Fig. 29—A cut-away view of the Dorrclone, showing the flow of materials.
(right) Fig. 30—The H & P hydraulic cyclone.

There are two basic rules which must be followed in order to obtain effective hindered settling classification:

1. The velocity of the rising current which is used to keep the particles in the separation size range in teeter must be uniform across the full area of the column.
2. Velocities must be adjusted for variations in feed sizing and density, in order that the density in the separation column may remain uniform.

Recovery of the settled sized particles appears to be limited to "bottom-unloading" methods, with all of the disadvantages of these devices. The hydraulic water must be closely adjusted to prevent the teeter column from being carried out the discharge valve.

In order to disperse the incoming hydraulic water to obtain a uniform rising current, various methods have been attempted, with varying results:

a) The use of small perforations spread throughout the base of the column, or along the sides of a conical surface at the bottom of the column breaks the stream into smaller diffused streams.

b) By the use of "ragging" a bed of particles too large to be moved by the current, the

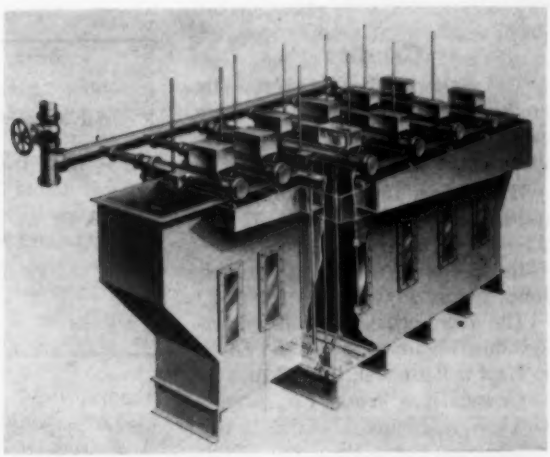


Fig. 31—This partial cut-away view of the Jetsizer shows the multiple jets for subdividing the hydraulic water and the valving mechanisms for recovery of the product.

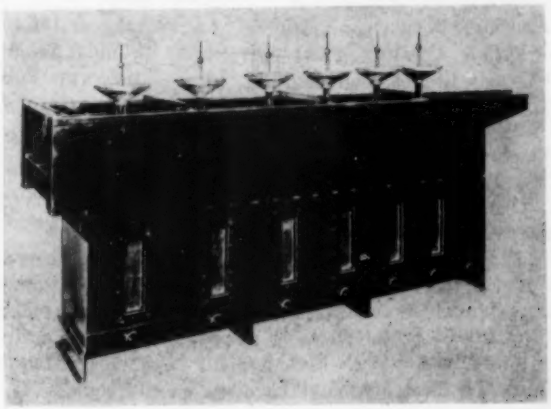


Fig. 32—The Fahrenwald type of hindered settling classifier.

water is forced to channel through the interstitial spaces, with a result much the same as in the foregoing.

c) By using multiple jets at the bottom of the column, the same effect is obtained in the Jetsizer. (Figure 31)

d) Professor Richards offered many years ago a whirling current of water which breaks up as it enters the column; this is the vortex classifier, not too common in use.

In all cases, however, an attempt is made to use the top section of the hindered settling classifier as a rising current classifier to remove particles which are manifestly smaller than the separation size; the remainder of the solids are then concentrated in a column of more restricted area, thus increasing the density of the column at this point, and as a consequence, the differential in the velocities required to separate particles whose size differential is small. (Figure 32, 33, and 34) (Note comparison to the right.)

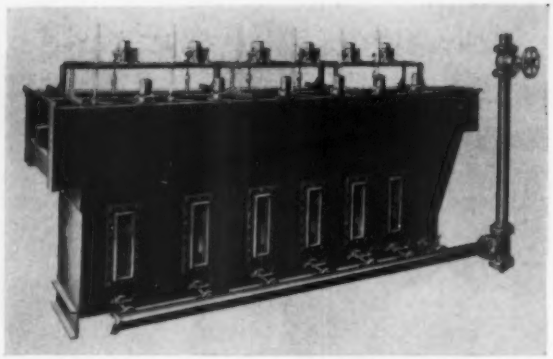


Fig. 33 — A semi-automated type of hindered settling classifier.

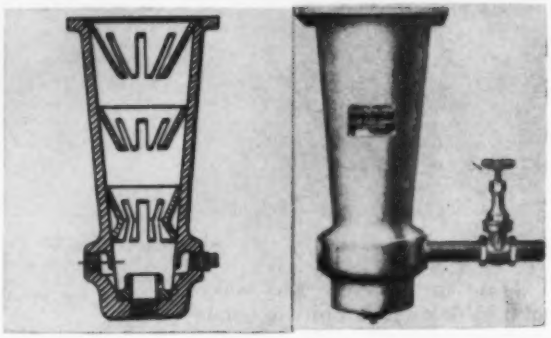


Fig. 34 — The compound funnel hindered settling classifier, with a sectional view at the left.

Advantages — Hindered Settling Devices — Disadvantages

Advantages	Disadvantages
1. Sharp separations of fractions	1. Small capacity of devices 2. Control of operations is demanding 3. Large quantities of water required 4. Products must be dewatered

Credits

The author wishes to express his gratitude to the following for their assistance in furnishing pictures and illustrations used in this paper:

Dorr-Oliver Inc., Stamford, Connecticut, Figures 23, 29, 31, 32 and 33

Eagle Iron Works, Des Moines, Iowa, Figure 21

The Hardinge Co., York, Pennsylvania, Figures 4, 5, 17 and 18

Heyl & Patterson, Inc., Figure 30

Georgia Iron Works Co., Augusta, Georgia, Figure 27

Meckum Engineering Inc., Ottawa, Illinois, Figure 11

McLanahan & Stone Corp., Hollidaysburg, Pennsylvania, Figure 22

PIT & QUARRY PUBLICATIONS, Chicago, Illinois, Figures 3, 12, 13, 15, 16, 24, 25 and 34

WEMCO Division of Western Machinery Company, Figures 1, 7, 19, 20, 26, 28 and 30

Charles E. Wood Co., Milwaukee, Wisconsin, Figures 2 and 10

The following authors were consulted in determining some of the basic fundamentals of classification: *Text Book of Ore Dressing,* Richards and Locke, 1925, McGraw Hill Book Co.; *Ore Dressing,* Theodore Simons, 1924, McGraw Hill Book Co.; *Handbook of Mineral Dressing,* A. F. Taggart, 1947, John Wiley & Sons, Inc.; PIT & QUARRY HANDBOOK, 1958, Pit & Quarry Publications; and *Fundamental Principles of Sand Settling,* E. Shaw, 1943, Tradepress Publishing Co.

Part III, the Appendix, will appear in a subsequent issue.

Anna Quarries

(*Continued from page* 88)

the newer machine. In addition, it is possible on the latter unit to "kick in" the controlled gravity dump in the middle of a full gravity discharge, and *vice versa.*

From the hopper, the rock is transferred into the cable-cars on a Cedarapids feeder for transport to the top of the plant. There, after primary reduction, the crusher-run stone is elevated to begin a gravity flow through the various screening and recrushing operations. Finished materials are chuted into appropriate underlying bins from which they are drawn for delivery or transfer to stockpile.

Heading the operation at Anna is G. H. Rippetoe, manager, who, having been at this location since 1921, has played a leading role in its development. He is assisted by C. C. Treece, plant foreman, and L. Kemp, quarry foreman.

Part II

Well Engineered Electric Power Distribution For Quarries and Mines

By T. H. ANDERSON

Voltage-Speed Relation

PULL-OUT torque of the a.c. induction motor is lowered when the applied voltage is reduced, and the speed-torque curve takes a form such as that shown by the broken line in Figure 3.* At peak loads of the order of 175 percent or more of the motor rating, which are normal requirements in shovel operation, this curve shows a considerable loss in speed, as compared with the full-voltage curve. The shovel-generator voltages are thereby reduced, both by the loss in speed and also by the reduction in exciter voltage, if the exciter is driven as a part of the main m.-g. set as is true in most modern shovel equipments. The result is reduction in speeds of all shovel operations. Moreover, the generator maximum currents are lowered almost in direct proportion with the exciter voltage, and the d.c. motor fields are weakened, lowering the stalling torques of the shovel drives.

The net result is that the generator volt-ampere and power curves are lowered by reduction in a.c. voltage. The electrical equipment "loses power" and the shovel tends to become sluggish in operation. This may not be appreciable if the voltage does not fall below 90 percent of rated a.c. motor voltage, but it is apparent that the shovel performance will be affected more or less by any drop in a.c. supply voltage. Where feasible, it will prove advantageous in most cases to design the power distribution system to hold the voltage at all times above 95 percent of rated value, particularly where any of the main m.-g. sets of shovels are driven by induction motors.

Synchronous Motors

A synchronous motor operates at constant speed, fixed by the number of poles for which the motor is wound and by the frequency of the power supply. Its speed is not affected by variations in voltage, as long as the torque demand does not exceed its pull-out torque. If this torque is exceeded, the rotor pulls off synchronism and drops in speed, and heavy currents are drawn which will overheat the windings dangerously if the motor is not disconnected, or is not resynchronized in a very short time. Synchronous motors driving shovel m.-g. sets are ordinarily designed to develop the required pull-out torque at 90 percent of rated voltage; and power distribution systems for mines and quarries using such motors should be designed to hold the voltage above this value at all times. Otherwise, a sacrifice in the power available in the shovel equipment and the loss of performance may be experienced.

The drop in voltage at any point in a.c. power distribution is made up of the resistance and reactance drops caused by the currents flowing in all component parts of the system up to that point.

There may be a voltage drop in the primary system from which

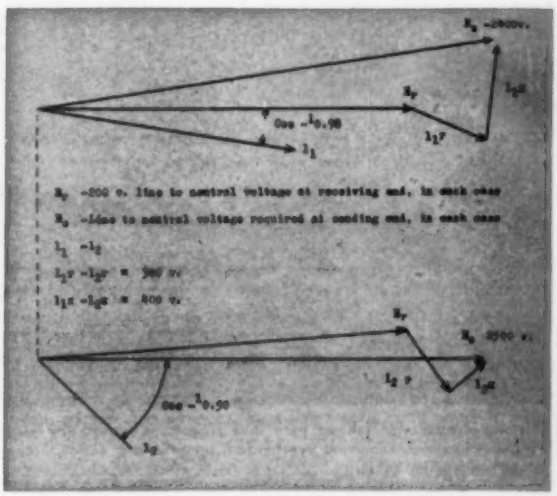


Fig. 4—Effect of power on voltage drop in distribution system, assuming equal values of power transmitted.

* (Figures 1 to 3 appeared in Part I, July, 1959, PIT AND QUARRY, pages 80 through 88.)

power is taken, but if the capacity of this system is large in comparison with the plant power demand, as is usually the case, this normal voltage drop will be negligible. However, any periodic variations which occur in the incoming voltage supply to the plant must be taken into account in the design of the distribution system, as the voltages in the plant will vary in direct proportion.

The reactance and resistance of each part of the circuit are determined by the length, the wire size, and the spacing. The various resistance and reactance line voltages subtract vectorially from the incoming supply voltage (divided by the transformer ratio), and their effect on the voltage is influenced by the phase angle of the current, or in other words, by the power factor. (Figure 4)

Improving Power Factor

The current vectors are of the same value, but at different phase angles. For any given quantity of power transmitted, of course, an improvement of power factor reduces the amount of current, as well as the phase angle, and lowers the voltage drop. At higher power factor the vector subtraction of the reactive voltage drop will lower the voltage at the receiving end by a smaller amount. With any considerable amount of reactance in the distributing system, therefore, as will be the case with transformers or overhead lines, the use of synchronous or other apparatus taking current at a high or leading power factor, in sufficient amount to offset the lagging currents of inductive apparatus and raise materially the proper voltage of the combined load, will greatly assist in maintaining proper voltages at the shovels and other mining equipment.

Furthermore, as improvement of the power factor lowers the current in the system and the kv.-a. loading of transformers or the power source, greater power loads may be carried by transformers or generators already installed.

If conditions do not favor the installation of synchronous apparatus, capacitors may be used for power-factor correction and improvement of voltage regulation in the plant distribution system. For maximum benefit they should be located as near the load as practicable.

Power Factor Corrective Equipment

Exact rules cannot be given here for the selection of the rating and the most beneficial location of power factor corrective equipment. These can be determined only by a study of each system as an individual problem, taking into account the constants of the different parts of the system and the character and distribution of loads expected.

It should be noted in this connection that synchronous motors, designed for 90 percent leading power factor at rated load, take currents of the order of 70 percent of the full-load current, at very nearly zero power-factor leading, when operating at no-load. If such a motor (or motors) makes up a considerable part of the load on the distribution system, the large leading currents drawn at no-load may cause a rise in voltage in the distribution system circuit and transformers. Thus, the voltage impressed on the motor, as well as on the other apparatus connected to the lines, may reach an unsafe value.

Synchronous Motor Regulation

By automatic regulation of the synchronous motor field strength, the variation in power factor and currents drawn by the motor may be limited and, consequently, more stable voltage may be maintained at the shovel. Regulating equipment for this purpose must be capable of quick response to rapid, wide changes in motor load throughout the operating cycle of the shovel. The Rototrol equipment made by the Westinghouse Company is particularly adaptable to the problem.

Synchronous motors should have distribution circuits designed to have the lowest possible and practicable reactance, to limit the voltage rise at light loads.

Transformer Regulation

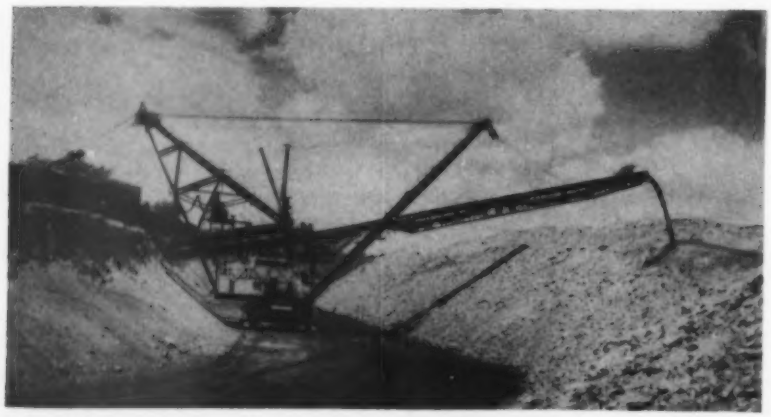
Due consideration is not given to the fact that a considerable part of the voltage drop in a power distribution system may occur in the transformers feeding the system. Transformer windings have a resistance and reactance, and voltage drop in these windings is influenced by the power factor of the load, just as in the distribution system lines.

Transformers of the types and ratings used to supply mine distribution circuits generally have a regulation of the order of 1 percent at 100 percent power factor and 4 to 5 percent at 90 percent lagging power factor.

The regulation of a transformer may be defined as the difference between the no-load and the full-load secondary voltages, at a specified power factor, for the same primary voltage expressed as a percentage of full-load secondary voltage. In other words, the regulation is a measure of the voltage drop in the transformer windings.

Inductive Loads

If the plant load is composed largely of inductive apparatus, such as induction motors on shovels, drills, and other auxiliary equip-



This wheel excavator (shown here in a strip coal mine), one of the most unusual types of equipment used in removing overburden, operates on 1308-v., 3-phase, 60-cycles a.c. supplied through a trailing cable.

ment, with heavy peak demands at lagging power factor, the voltage drop in the transformers cannot be neglected. Its effect on the overall voltage regulation of all the system is reduced, however, if corrective apparatus is applied to raise the power factor of the peak load.

In some cases it may prove economical to apply transformers of special low-impedance design to reduce the regulation and assist in maintenance of better voltage supply to shovels and other mining equipment during peak load periods without exceeding, at light-load, a voltage the motors can safely withstand.

Tap Changing Transformers

If a number of shovels and other mining equipment are supplied from the same transformers, so that in normal operation the variation in loading of the transformers is not great, the transformer voltage regulation should still be taken into account as the loading may be reduced to a very low value with consequent rise in voltage during idle shifts or periods of curtailed production. It is during these times that auxiliary equipment stays in circuit and suffers the baneful effect of high voltages. Incandescent lighting bulbs operate at 50 percent less than the rated lumen hours, power tools literally fly apart from overspeeding, and heating equipment burns out in spite of thermostat controls and properly fused circuits. For such conditions, if the transformer no-load voltage exceeds 110 percent of rated motor voltage, the use of tap changing equipment on the transformers may be warranted to lower the light load voltage to a safe load voltage when only a few motors are in service.

Distribution System Layout

Selection of a site for the transformer substation is generally made as a compromise among various more or less conflicting factors. Main considerations are: location of the incoming high-voltage lines; permanence of site; shelter from blasting areas; accessibility for construction, inspection and maintenance; and location with respect to the average center of loading during the life of the mine or quarry.

By comparison of such factors in determining the best substation site, small differences of cost or performance will be outweighed by the importance of ready accessibility to avoid unnecessary delays in restoring service after interruptions at the substation.

Large drilling rigs are among the major items of equipment that benefit from carefully planned power distribution.

In an extensive area, where numerous shovels and other machines are used, several substations, each feeding separate circuits to different sections of the mine, may prove advantageous. In this way, material reductions can be made in the lengths of secondary distribution lines and the currents they are required to carry. In such cases, interconnections of the distribution circuits will often prove advantageous.

Method of Construction

As mentioned previously, many factors enter into the picture. Some of them are of a rather conflicting nature. Steel is, of course, the preferred material because of longer service life, and the ability to carry heavier circuits as well as to withstand severe storm onslaughts.

Next in line is creosoted wood construction, which became very popular because of the metal shortage during World War II. Most of these structures are still in service if the poles were set in concrete in addition to being pressure-treated with creosote. True, the older poles do suffer woodpecker onslaughts that can be serious, to say the least.

Mines—Quarries

At the mine or quarry in which the boundary of the mining area does not change over long periods of time, high-voltage powerlines are often carried to points near the edge of the pit, and from these points more or less permanent lines are carried into the operation over light steel or wood pole construction.

Flexible cables tap into these lines at convenient points, connecting to portable switchhouses that protect the individual shovel feeder cables, or to small portable transformer substations supplying low voltage circuits to drills and other equipment.

In some cases, where electric haulage circuits are present, the a.c. power distribution lines are carried on the same poles with the trolley system.

Temporary circuits are sometimes provided by flexible cables connected to the pole line outside the pit limits and laid across the mining benches. Incoming lines at moderately high voltages are sometimes carried into the mining area, and portable transformer substations are used to step down the voltage for the individual shovel feeder cables, etc. (*Turn page*)

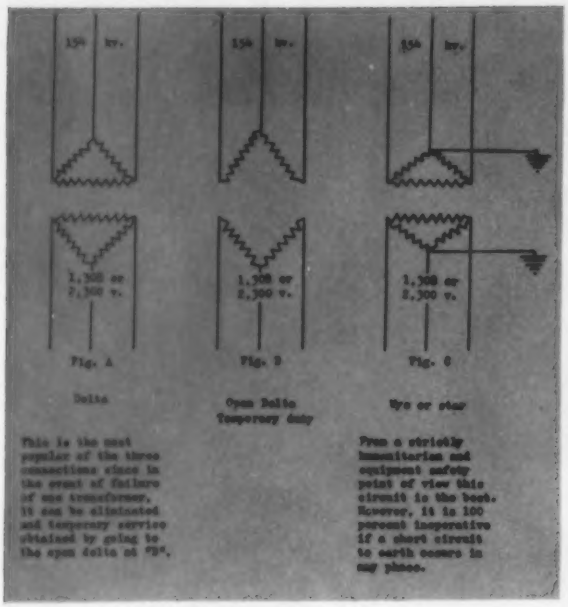


Fig. A, Fig. B, Fig. C—The three standard transformer connections.

Strip Coal Mines

At strip coal mines in which large areas are mined out in a relatively short time, pole lines must be placed some distance away from the area opened to avoid frequent movement. To provide for connections to the overhead line at fairly close intervals and, at the same time, have the main pole line in a permanent location, a system of laterals to the workings may be used. The lateral pole lines on the unstripped area may be carried to points near the high wall, and flexible cables from the ends of the lines may be laid into the mine to portable switchhouses.

With this arrangement, the lengths of the portable cables (including the high-wall cable) to shovels and other equipment in the mine need be long enough only to reach the end of the nearest lateral; and as the high wall advances into the unstripped area, the lateral poles are shortened, leaving the main pole line undisturbed.

In some cases it is preferred to install well-guyed poles carrying load spans in the lateral pole lines, and to use several sections of portable cable with a total length approximately the same as that of the span, from the end of the overhead lateral to a junction box on the high wall to which the hill cable connects. This permits the laterals to be shortened in several stages, by removing sections of the lateral cables before the end spans have to be taken down.

Armored Cable Method

At some strip coal mines, steel-armored main cable is laid above the high wall, a short distance from the edge of the pit, with cable in about 1,000-ft. lengths connected together. Three-way junction boxes are used at points from which circuits are to be carried into the mine by flexible cables. The armored main line cable wound on reels, and the junction boxes on their individual skids are hauled about the operations by tractor or large truck.

Shovel Cables

Although there is a variety of detailed construction in the flexible cables carrying power at 2,200 volts or higher to shovels or portable auxiliary transformer stations, the basic construction consists of three rubber-insulated power wires, with a wrapped or braided sheath of tinned copper wires around the insulation of each power wire, and with ground wires laid in the valleys between the triangularly spaced power wires. A heavy reinforced outer jacket of rubber compound provides resistance to abrasion. In some cases, a woven copper sheath is used under the outer jacket.

The purpose of the sheaths over the insulation of the power conductors is to reduce voltage stresses on the insulation and the effect of corona, and also to give some protection to men handling the cable if there should be failure or weakness in the insulation. The ground wires, in contact with the sheath, have a total cross-sectional area near or equal to that of each of the power wires.

Cables of this description are used with power wire sizes increasing from #8 used in 4,160-volt supply to the smallest electric shovels. Lengths ordinarily used are from about 500 ft. up to 2,000 ft. or more. Approximate characteristics of shovel cables are as given in the table listed below:

Approximate 60-Cycle Characteristics Of Three-Conductor Portable Cables*

Wire Size A.W.G.	Current Carrying Capacity (Amperes)	Resistance (Ohms) Per 1,000 ft. at 100°C.	Series Reactance (Ohms) Per 1,000 ft.
0000	190	0.069	0.036
8	43	0.860	0.052
6	56	0.540	0.048
4	72	0.344	0.043
2	96	0.216	0.042
1	110	0.173	0.040
0	126	0.138	0.039
00	148	0.109	0.038
000	166	0.087	0.037

*For ambient temperatures of 40°C. and copper temperatures at 60°C., with cables in air. Correction factors should be applied to the specified current capacities when cables are wound on reels.

Alternating and Direct Currents

With alternating current, the voltage drop in the circuit is made up of two components: resistance drop and reactance drop. The former varies inversely as the size of the wire; the latter may not be much affected by the wire size. Spacing of wire in three-phase transmission materially affects reactance drop, three-wire insulated types giving the least drop.

With unity power factor, alternating current for three-phase mine circuits requires about 75 percent of the copper required for direct current of the same voltage. This percentage varies inversely as the square of the power factor. If the power factor is sufficiently low, therefore, a condition may exist in which the copper required for alternating current may be greater than that required for direct current, to give the same voltage at the

points of utilization, or the same line loss for the same horsepower transmitted.

Alternating current is generally used three-phase, because three-phase motors have better starting characteristics than single-phase motors. Two-phase motors require four or five wires for best characteristics. When alternating current is used, step-up transformers are used to transmit to distant points, and step-down units to bring the potential down to safer and more workable voltage. 2,300 volts is a popular voltage to be fed into shovels, pumps, augers, and conveyor belt installation. It may readily be reduced to 440 for auxiliary power equipment and then again for the popular 240-120 single-phase, three-wire voltage used for lighting and tool work.

It is essential that the transformer be of the proper size to maintain the voltage at maximum, even under full load, since an alternating-current motor runs at practically constant speed when the voltage is reduced, but the important torque falls off very rapidly. A 440-volt motor will run at practically constant speed when connected to a 220-volt source, but its torque will be reduced by fully ¾. If the voltage drops enough, the motor will pull out of step; that is, it will stop. On the other hand, it is not too uncommon to find direct-current motors running at ½ voltage.

For satisfactory performance of alternating-current machinery the following points must be observed:

1. Voltage must be maintained approximately normal at the points of use.
2. Wiring must be installed in the best possible manner with well soldered joints.
3. Transformers must be kept up close to the point of operations.
4. Machines should be started without load whenever possible.
5. All connections must be kept clean and tight to retain good conductivity.

Transformer Connections

Besides being used to step up or step down voltage in the normal sense of powerline transmission, transformers are consistently used to compensate for line drop by utilizing tap changing features built into the secondary site. This means that the substation need not be moved as frequently.

Either three single-phase transformers are used for the three-phase power, or one three-phase transformer. When three single-phase transformers are used, they are generally connected in delta as in Figure A. This connection is most suitable for mine work, since service will not be interrupted if one transformer fails. (In this case the connection would be as shown in Figure B, known as the open delta.)

When the closed delta type of circuit is used, the capacity of this bank of transformers is equal to the sum of the individual capacities of the three units, expressed in kilovolt-ampere or kv.-a. When open delta is used, the transformers will deliver only 86.6 percent of the combined rated capacity of the two transformers, or 57.8 percent of the combined rated capacity of the three transformers. The capacity of the three transformers for a given work should therefore be large, in order that a large percentage of the motors may operate, should one of the transformers fail. When connected in closed delta, each transformer is subjected to the full line voltage, but the amperage in each transformer is only 57.8 percent of the amperage in each line wire.

Sometimes it is advantageous to connect transformers in Y or star, as shown in Figure C. In such cases the neutral point of both high and low voltage sides should be grounded. With this connection, if one transformer fails, the bank of transformers is inoperative. The voltage on each transformer is 57.8 percent of the line voltage, but the current in each transformer is the same as that in each line lead. This connection is on the side of safety, since a ground on any one of the lines will short-circuit that line, blow the fuse or breaker, and render the line inoperative, thus protecting the men and minimizing the danger of fire.

Lightning Protection

The connection is all that can be desired for shock protection of personnel, but the installation is not complete until consideration is given to protection against lightning. Type L V lightning arresters should be applied to the line side of the substation breaker.

Lightning arresters on the high- and low-voltage sides, as well as transformer tanks, current, and potential transformer secondaries, and steel structures and fences should be connected to a low-resistance ground established at the substation. The resistance of the main substation ground should be held to 1 ohm or less, if practicable.

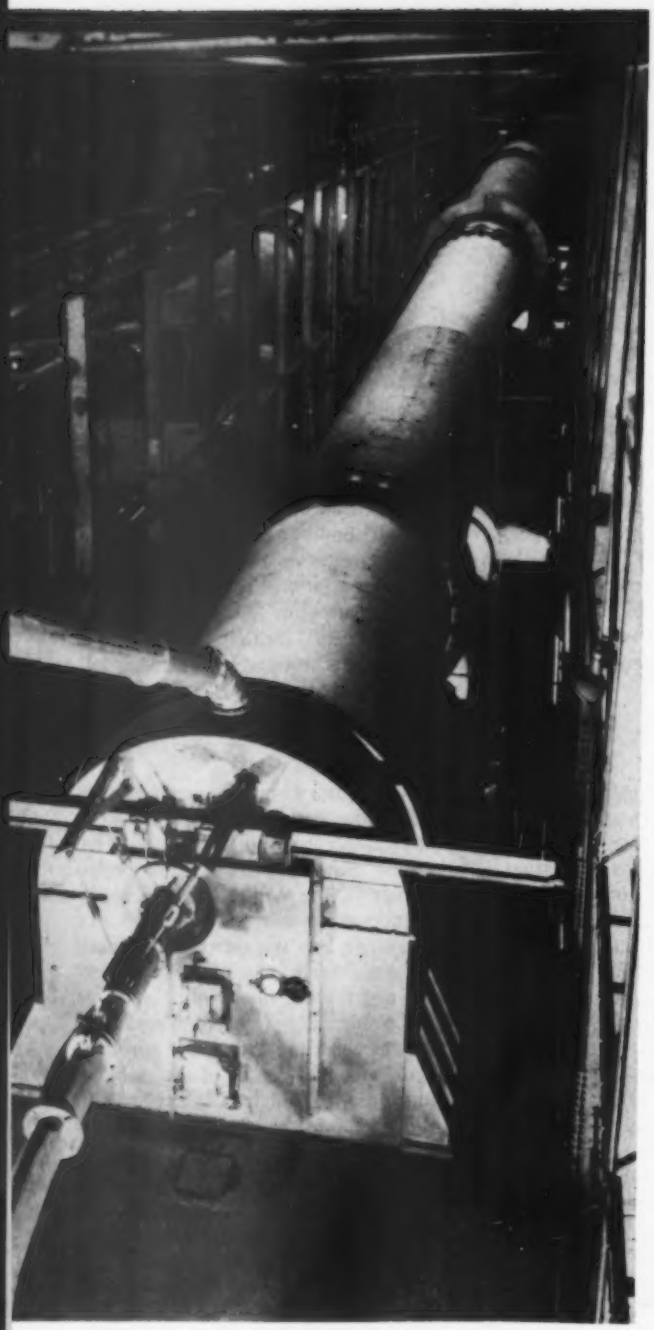
The best protection to operators will be provided by a ground network of bare conductors, buried to sufficient depth to insure contact with moist earth, and covering an area extending 6 to 10 ft. outside the substation fence. The main ground conductors should be spaced fairly uniformly in one direction from the station, with connections between all wires at each end and to other laterals located conveniently to points of ground connections of the station apparatus. These ground connections should be made at the points of connection of the main and the lateral wires.

A resistor of high ohmic resistance value should be connected between the transformer neutral and the substation ground, with a current transformer in the neutral ground lead, connected to a type CO relay arranged to trip the substation circuit breaker, in case of a ground fault on the distribution lines.

To minimize the rise of potential above earth of protective ground wire, and the frames of any mobile machines to which it is connected, during lightning arrester discharges or in case of flashovers of any kind in the substation apparatus, the substation grounding resistor should be connected to a ground separately constructed, and not interconnected with the main substation ground. The protective ground should not have more than 5 ohms resistance, and should be located some distance away from the main substation ground, to prevent an unsafe rise of potential of the protective ground system at the times heavy fault currents may be flowing into the main ground.

As resistors of high ohmic value, lightning arresters must have a voltage rating at least equal to the maximum phase-to-phase voltage of the circuits.

dolomite + sea



One of the five rotary kilns at Steetley's Hartlepool plant, in which the final product—granulated "Britmag"—is produced. The kilns are fired by pulverized coal and operate at a temperature of more than 1600 deg. C.

ON the occasion of a recent gathering of the Refractories Association of Great Britain a visit was paid to the £5,000,000 Hartlepool works of Steetley Magnesia Company Ltd. to study the process whereby dolomitic lime is reacted with sea water to precipitate magnesia. Starting from a bathtub experiment in 1937, the process has now reached a rate of production of 150,000 tons a year, and the plant is claimed to be the world's largest producer of chemical magnesia.

Before the World War II, Austria, with its large natural deposits, had a virtual monopoly of the supply of refractory magnesia to the British market. It controlled the production and selling price of magnesite bricks in the United Kingdom and forbade exports. Steetley's pioneering work in the production of synthetic magnesia was, in fact, launched just in time to make a valuable contribution to the war effort. Since then, the continued growth of the Hartlepool sea water plant has enabled the British refractories industry to become independent of Continental supplies and control.

Dolomite stone, a rock consisting of a double carbonate of lime and magnesia, occurs in many parts of Britain. It was first quarried by The Steetley Company Ltd. near Steetley, in Nottinghamshire, in the 1880's. After being dead-burned, it was supplied to steelmakers to line the furnaces for the newly developed basic steelmaking process. As the demand for dolomite increased, more quarries were acquired and additional processing plants were built.

Realizing that the use of dead-burned dolomite as a refractory material could be further extended if the tendency to hydrate could be suppressed, the management of the Steetley Company, in 1936, pioneered a major technical development by adding serpentine (found in Cornwall) to produce a burned dolomite which would be resistant to attack by atmospheric moisture, thus opening the way to the large-scale manufacture of stabilized dolomite clinker, bricks, and cements.

Close on the heels of this development came the pioneering work on the extraction of magnesia from sea water.

Today, Steetley is believed to be the largest producer

water = refractory magnesia

By JOHN GRINDROD, B.A. (COM.)

of refractories in Europe and the Commonwealth, with an annual production of 800,000 tons of finished refractories and 400,000 tons of other materials. Its operations are conducted by three main divisions in the United Kingdom—dolomite, magnesia, and refractory bricks. There is also a successful and growing Canadian division, established in 1952.

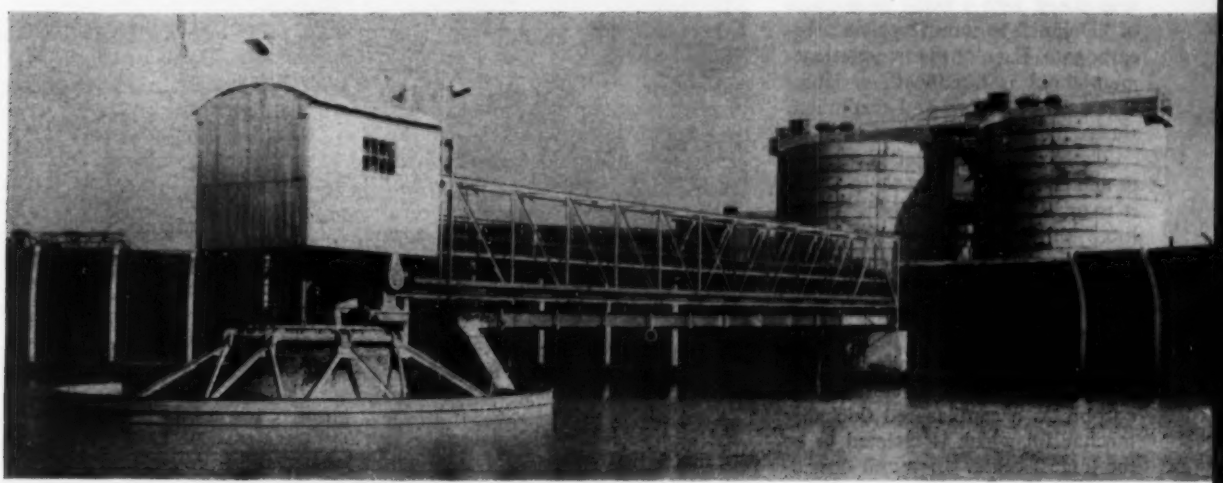
As its name suggests, the dolomite division is concerned with the extraction of dolomite from deposits in Nottinghamshire, Yorkshire, Durham, and Wales. After being processed and graded, the larger-sized material is dead-burned and used for making basic refractories for steel furnace hearth construction and maintenance.

The smaller sizes of stone are ground to a fine powder and supplied to collieries for the neutralization of explosive coal dust and to farmers for use as a soil conditioner. The two Durham quarries provide dolomite stone which is calcined on the site to "Dolime" for use in the company's sea water magnesia process.

These quarries are located at Thrislington and Coxhoe. At the former there is one 350-ft. long rotary kiln fired with pulverized coal and equipped with a rotary cooler. Steel heat exchangers operate in the feed end of the kiln and cooler. At Coxhoe, there is one 300-ft. long rotary kiln, fired with pulverized coal, but equipped with a planetary cooler. There are also five 100-ft. high shaft kilns fired with coke and fitted with skip hoist feeds and automatic discharge mechanisms. Centralization of the control equipment and instruments has been applied to convert the double carbonate to the oxides and yield a reactive product. All the kilns are lined with "Britmag" refractory bricks insulated with firebricks in the burning zone. Both the rotary kilns are fitted with multicell high efficiency cyclones for dust collection.

At Hartlepool, the "Dolime" produced at the Thrislington and Coxhoe quarries arrives in covered wagons and is first slaked to a fine dry powder in hydrators, the calcium oxide being converted to hydroxide. There are five hydrator units with self-regenerative heating systems. All are fitted with automatic weigh-feeders. The hydrated product is made into a slurry to facilitate handling and mixing with the sea water and is classified to remove impurities introduced from the fuel during the dolomite calcination. Two of the hydrator units have pneumatic classifiers, and three units hydraulic classification plants. The slurry is then ready for mixing with

A general view of the reaction system, showing the two reaction tanks and the settling tank.



The "Dolime" hydration plant, where the "Dolime" is slaked with fresh water to a fine dry powder.

sea water in agitated reaction vessels.

Sea water is drawn by centrifugal pumps through pipelines from the sea and is discharged into large storage tanks which ensure a steady flow to the process at all stages of the tide. Three jetties, 950 ft. long, constructed in greenheart timber, support the cast-iron pipelines and intake strainers. Three pump houses contain the five centrifugal pumps operating at 25-ft. suction. (Atmospheric pressure = approximately 34 ft. of water.) The pumps are driven by 600-hp., 2750-v. motors. The four sea water storage tanks, two of which are constructed of prestressed concrete and two of conventional reinforced concrete, have a total capacity of 8,000,000 gal.

From the storage tanks the water flows to pretreatment tanks, where it is dosed with a small proportion of "Dolime" to remove calcium bicarbonate. Each of the five pretreatment tanks is fitted with variable-speed central drive and diaphragm sludge pumps.

Thence, the sea water is pumped to agitated reaction vessels in which it is mixed with the classified "Dolime" slurry. There are three reaction systems, each comprising two reaction tanks with agitators and one settling tank with a continuously rotating thickener mechanism. The most recently installed settling tank is 255 ft. in diameter and incorporates a cantilevered thickener mechanism which is claimed to be the largest center-drive unit operating in Europe. The tank capacity is 3,500,000 gal. of sea water.

In the reaction vessels magnesium hydroxide is precipitated as a dilute suspension as a result of the reaction between the calcium hydroxide and the magnesium salts in the sea water, and is allowed to settle in the large-diameter shallow tanks with the magnesia from the "Dolime." The settled product is drawn to a center well by rotating rakes and is withdrawn as a sludge with a consistency of thick cream.

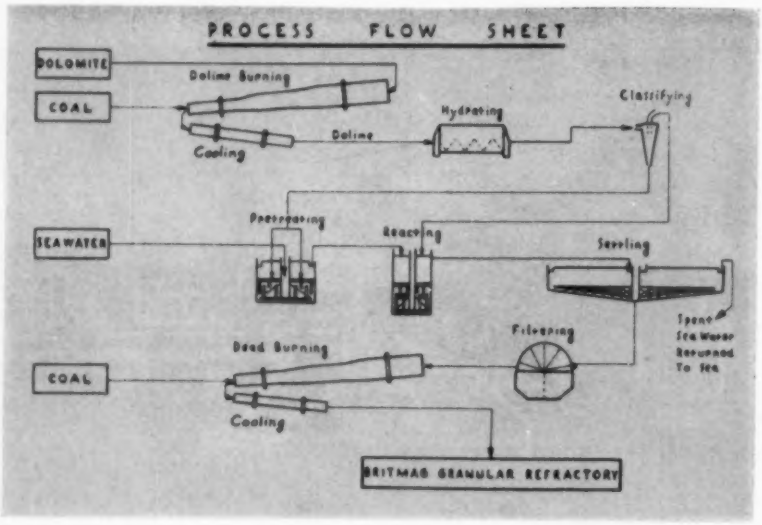
After being washed with sea water in one of two systems, each of which comprises one reaction tank and one settling tank with a continuously-rotating thickener mechanism, the sludge is filtered on rotary disc vacuum filters. There are 11 such filters with automatic pressure discharge gear and variable-speed drive mechanisms. The filtering medium is heavy-gauge staple nylon-cotton spun fabric.

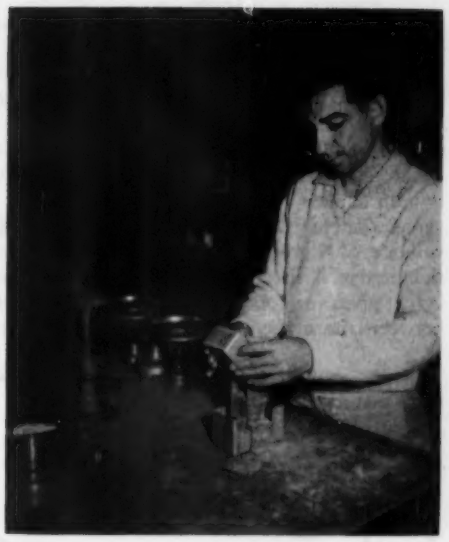
Containing 50 percent solids, the filter cake is fed into rotary kilns fired by pulverized coal and is dead-burned at a temperature of over 1,600 deg. C., to give the minimum of 90 percent pure "Britmag" magnesium oxide. Each of the five kilns, the latest of which is 250 ft. in length, is equipped with a rotary cooler. They are also fitted with waste heat regenerators and are lined with magnesite refractory bricks prepared from "Britmag" in the burning zone, backed with firebrick insulation to minimize heat losses.

Three 70-ft. high reinforced concrete spray towers provide countercurrent washing of the kiln exhaust gases. These towers, working in series with three wet electrostatic precipitators operating at 50,000 v., give a 99.5 percent clean gas discharge.

Electric power for the plant is taken from three incoming feeders at 20,000 v., two feeders being arranged in the form of a ring main, with the third as an independent feeder to ensure continuity of supply. Three sub-stations, strategically located, are used for distribution of power at 440 v. and 2,750 v. in

(*Continued on page* 106)





Because of its accuracy in splitting small samples (5 grams) the micro-splitter, shown in use in the Del Monte laboratory, was a most valuable tool in developing the quick-estimation technique.

By HARRY F. UTLEY

Quick method for estimating alumina in silica sands

ANOTHER ON THE SPOT REPORT

Many industrial sands occurring in the west are feldspathic for the most part, containing varying amounts — from less than 1 percent to over 12 percent — of alumina. Some glass-makers and other industrial consumers are not too concerned over the amount of contained feldspar, being primarily interested in gradation and color. Others, however, insist on low Al_2O_3 content and set up very rigid specifications regarding its content in the sands they purchase.

Del Monte Properties Company has for many years shipped a white beach sand from its plant near Pebble Beach, Calif., and, since 1950, has been employing flotation for iron removal and the separation of quartz and feldspar (see PIT & QUARRY, June, 1953). Consumer demand for the control of alumina content is extremely critical, some accounts limiting it to less than 2 percent, others to less than 1 percent Al_2O_3.

The standard Quinolate method for determining alumina is lengthy and time-consuming. The HF-H_2SO_4 evaporation step is especially critical and, if forced, splattering is apt to occur with a resulting loss of sample. Standard procedure is to take the sample to dryness overnight at a reduced temperature. Even with forcing, the procedure usually takes two to three hours to complete.

Recently, Del Monte developed a rapid method for estimating alumina content in the sand which permits a grab sample of the quartz product to be taken during processing and analyzed in 10 minutes or so. The procedure, while not truly accurate, does indicate whether or not the plant is meeting specifications for a certain product, and it has eliminated taking many shift samples, as was formerly required, and painstakingly analyzing each one. The management is not so much interested in knowing whether a sample assays 1.75 percent Al_2O_3, or 1.95 percent Al_2O_3, as in knowing that it is below 2.00 percent Al_2O_3. The same thinking is applied to a product which is required to be below 1.00 percent Al_2O_3.

A step-by-step description of the procedure was revealed during the 1959 annual meeting of the American Institute of Metallurgical Engineers, in a paper prepared by Hugh H. Bein, manager of Del Monte's Sand Division.

After collecting a sample, it is drained, filtered, and quickly dried. The sample is then split: first in a regular Jones sample cutter, then down to about 5 grams through a Sepor micro-splitter. The micro-splitter has proved to be a valuable aid in developing the technique as it yields a remarkably even split on small samples. It has fourteen ⅛-in. slots, is non-magnetic, and produces no electrostatic charges.

The 5-gram sample is then screened over a 50-mesh sieve to reject undersize. This procedure might vary for other operations, depending upon the average grain size of the individual deposit.

A grain size should be chosen that is small enough to eliminate excessive middling particles and is still large enough to be seen readily. A small corner of a middling particle may later absorb the dye, yet this middling particle could not be counted as a full grain—the operator will have to combine several of these small middling particles to count as a single grain.

After a number of these determinations have been made, the operator will be able to weigh and estimate the part that the middling particles should play in the sum of the total. As a rule, the finer-mesh sands will contain more feldspar than will the coarser, so the choice of screen size will affect the factor for that particular sand. At Del Monte, for instance, a count of 16 particles of plus 50-mesh sand indicates an assay of approximately 1 percent Al_2O_3. On minus 20- plus 40-mesh material, a count of only

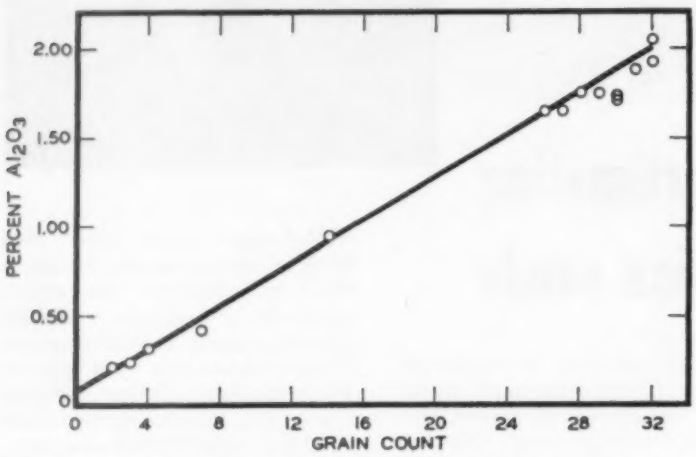
12 or 14 might yield the same assay.

After screening, 2 grams of the sample is weighed out, placed in a platinum crucible and etched with 3-5 ml. 38.40 percent HF for 1 minute at room temperature, followed by decanting and washing. The sample is then stained for 2 minutes in the same crucible with a 1 percent water solution of Nigrosene dye. This particular dye is used because its blue color gives a good dark contrast between the etched (feldspar) and unetched (quartz) grains. The next step involves decanting, washing, drying, and splitting five times through the same Sepor micro-splitter. The grains are then counted.

The simplest counting method, and the one adopted as standard at Del Monte, is to count only the stained particles, using a low-power magnifier. Both the stained and unstained particles may also be counted in a lengthier procedure to obtain the ratio between them and for more accuracy. However, it was found that this small increase in accuracy did not warrant the added time and effort required in making a total grain count.

Grain count is then coverted to alumina content on a graph, such as seen here. In actual practice, should a 32-grain count be obtained on a sample, there might be danger that a 2 percent alumina product was being produced. However, this procedure has never resulted in a 30-count sample assaying over 2 percent, so the laboratory feels reasonably safe that they are meeting specifications with a count of 30 or less. The same reasoning applies to a 15-count sample when making a 1 percent Al_2O_3 product.

Some adjustment might be necessary in using the method with other feldspathic sands, since the Del Monte sand is rather unique in that less than 1 percent of the raw sand is retained on a 20-mesh sieve and less than 1 percent will pass 100 mesh. Therefore, they are not confronted with the problem of fines or oversize that might occur in other sand deposits. It is felt, however, that by the application of the proper factors and by the selection of the correct grain size, the described procedure could be applied to other sands.



Standard straight line graph for determination of 2 percent alumina or less. The standard line was plotted from a series of samples run chemically and counted. Standard statistical methods were used in computing the base line and the plotted points shown are counts made on actual samples during September, 1958. Note, the standard line does not pass through the origin.

Dolomite + Sea Water

(*Continued from page* 104)

order to minimize cable losses and to ensure efficient local control. A 180-hp. diesel alternator has been installed as a precaution against the possibility of a complete power failure. The whole of the power supply is controlled by automatic power factor equipment to ensure a continuous unity power factor.

Extensive technical control of the process results in a uniform, high-quality finished product made to a rigid chemical and physical specification which is not possible with natural magnesite.

A feature of the plant is the extent to which instrumentation has been adopted. For example, one man in a central control station regulates the flow of sea water throughout the works.

The chemical reaction of the process may be set down as follows:

$$CaO{\cdot}MgO + \begin{cases} MgSO_4 \\ MgCl_2 \end{cases} + 2H_2O \longrightarrow 2Mg(OH)_2 + \begin{cases} CaSO_4 \\ CaCl_2 \end{cases}$$

"Dolime"	Magnesium salts Sea water		Magnesium Hydroxide	Spent seawater Calcium salts

Thirty million gallons of sea water are processed daily. Incidentally, one cubic mile of sea water has been estimated to contain 9,000,000 tons of magnesia, or enough to keep the Hartlepool plant going for the next 120 years at the present rate of output.

The "Britmag" produced is used in making magnesite and chrome magnesite bricks for the steel and other industries. It is also used in granular form for the maintenance of steel furnace hearths.

Included in the Canadian division of The Steetley Co. Ltd. are a dolomite plant at Hamilton, Ont., and crushed and cut stone plants in southwestern Ontario. Crushed stone is supplied for road construction, railway ballast, and agricultural purposes, while the cut stone from the Queenston quarries near Niagara Falls is used as a facing material for large buildings. More recently, the Canadian division has entered into a partnership with two other companies to process steelworks slag as a roadmaking material and lightweight aggregate for building walls.

General Portland Cement Company plans expenditure of an estimated $21,000,000 on expansion through 1961.

By WOLF G. BAUER

Consulting Engineer

the Coming Role of Pozzolans

Part III—Bibliographic Review

IN Part II of this series (PIT AND QUARRY, July, 1959) we evaluated the factors which may eventually contribute toward the establishment of a recognized pozzolan industry. A discussion was presented of the various incentives which the use of pozzolans offers to both concrete user and producer alike. Discussed also were the economic incentives confronting the potential pozzolan manufacturer in building a business and industry.

At this point it may be of interest and value to present a general background reference list of what others have done and discovered in investigations of pozzolans and their effects upon mortars, concrete, and its products.

Since the turn of the century, and with several decades of concrete-made-with-portland-cement behind them, technologists in this field have striven to improve on the chemical resistance and stability of modern concretes, especially when it became necessary to combat the influences of sea water, soft ground waters, sewer acids, reactive aggregates, and heat-expansion problems in massive structures. Even a cursory look into the published literature points up the fact that the actions of certain pozzolanic materials, though little understood, have for some time impressed and intrigued researchers and users in many lands.

The references here listed probably represent about one-third of the published articles and papers on record over the last sixty years. However, much of the recent published literature is in foreign language periodicals; and while the writer has been privileged to study quite a number of these, there are as yet no translations or English language abstracts available. It is for this reason that reference to such literature has not been included in this bibliography, and only those which have been either abstracted or translated for English-speaking readers are presented here.

However, some libraries subscribe to many of the Italian, German, Spanish, Swiss, French, and other foreign technical journals from which readers with foreign language knowledge may derive additional up-to-date information on the subject. It is hoped, nevertheless, that the references here listed will be of useful interest and that the reader may be able to find them in the larger libraries.

In a future installment of this series we shall evaluate the various aspects of processing technology. We shall also have something to say about the new and coming field of "pozzolan accelerators" and the role of "blended-pozzolans" in the modern and future technology of buffered concrete and its products.

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Your local ESCO dealer can supply Points and Adapters for all your digging needs. By using ESCO Points and Adapters on all your equipment you can cut costs further by reducing your point inventory and consolidating purchases. Call your ESCO dealer today for details. He's listed in the yellow pages of your telephone directory. Or, write direct.

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ESCO Point shapes . . . start sharp, stay sharp and last longer under any digging condition.

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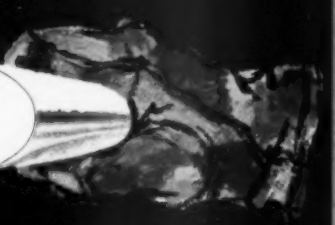

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N.C.S.A. Directors

and Manufacturers Division Executive Committee Meet at Hot Springs

By WALTER E. TRAUFFER

Plan expansion of research activities, discuss coming convention and exposition

THE board of directors of the National Crushed Stone Association held its annual summer meeting on July 23 and 24, 1959, at The Homestead, Hot Springs, Va. As usual this meeting was well attended, with 32 directors present, many of whom brought their wives and families. Also present were two honorary members. In addition to association business, many important national problems and subjects of interest to the entire crushed stone industry were discussed. Action was taken to expand considerably the association's research activities, and there was much discussion of plans for the coming convention.

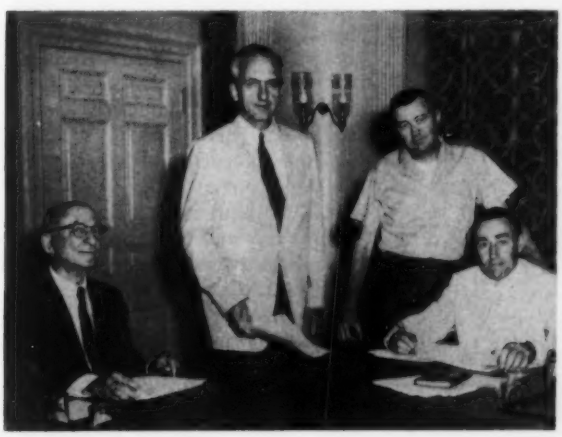
The executive committee of the Manufacturers Division of N.C.S.A. met the morning of July 23 with all members in attendance. Also present as guests of honor were several past-chairmen.

Coming Meetings The 1960 summer meeting of the N.C.S.A. board of directors will be held at The Greenbrier, White Sulphur Springs, W. Va. The 1960 Annual Convention and Machinery Exposition will be held at the Conrad Hilton Hotel, Chicago, February 22 to 24—the week following the conventions and machinery exhibitions of the National Sand and Gravel Association and the National Ready Mixed Concrete Association.

Monday, February 22, will be devoted to the directors meetings of N.C.S.A. (in the afternoon) and of its Manufacturers Division. Convention sessions will be held Monday morning and all day Tuesday—including an operating session—and on Wednesday afternoon, leaving ample time for the inspection of exhibits. Tuesday noon there will be a luncheon session for executives as well as a Manufacturers Division luncheon. The machinery exhibits will be open for inspection all day Monday and Tuesday and will close Wednesday noon.

The only official association evening entertainment will be an informal party on Wednesday night, of the type that has become so popular with this group. An excellent program of entertainment has,

Discussing procedure before the directors meeting are: standing, Warren C. Rowe, (Rowe Contracting Co.), president, and George D. Lott Jr. (Palmetto Quarries Co.), vice-president of N.C.S.A., with A. T. Goldbeck, engineering consultant, and Joseph E. Gray, engineering director (seated).



Also preparing for the meeting are: standing, J. R. Boyd, executive director, and J. Reid Callanan (Callanan Road Improvement Co.), treasurer; seated are Beatrice Gay and Bill N. Southworth of the N.C.S.A. staff.

All members of the N.C.S.A. Manufacturers Division Executive Committee were present, plus three past-chairmen. From left to right are: Wayne W. King (W. S. Tyler Co.); Warren C. Rowe, president of N.C.S.A.; Irwin F. Deister (Deister Machine Co.); F. A. Pampel (Chain Belt Co.); J. R. Boyd, secretary; J. C. McLanahan (McLanahan & Stone Corp.); L. A. Eiben (Northern Blower Co.); Chairman W. E. Collins Jr. (Atlas Powder Co.); B. R. Maloney (E. I. du Pont de Nemours & Co.); vice-chairman George D. Fraunfelder (Easton Car & Construction Co.); J. M. Hume (Pettibone Mulliken Corp.).

as usual, been arranged for the ladies. There will be a cocktail party or social hour every evening at 6:00.

There was considerable discussion of the 1961 convention, which is to be held at the Americana Hotel, Miami Beach, Fla., instead of at the Commodore Hotel, New York City, as originally planned. This will be either the week of January 17 or 24, depending on final agreement with the N.S.G.A.-N.R.M.C.A. boards which meet in September. In either case, Monday will be devoted to board meetings with convention sessions beginning on Tuesday.

The 1962 Annual Convention and Machinery Exposition will be held at the Conrad Hilton Hotel, Chicago, the week of February 18.

Executive Director In his report to the board, Executive Director J. R. Boyd spoke on developments which have taken place in recent months. The cost accounting manual which was recently completed is in great demand among members and non-members alike. He briefly reviewed the tremendous amount of work which went into this basically important N.C.S.A. publication.

The Concrete and Aggregates Producers and the Associated General Contractors of America (C.A.P.-A.G.C.) Joint Cooperative Committee, of which N.C.S.A. is a member, along with N.S.G.A. and N.R.M.C.A., will hold another meeting, probably late this year. According to Mr. Boyd, many important joint problems of these industries will be discussed and suggestions are invited. He also reported on other developments, including the interstate highway trust fund, and legislative activities. The active membership of N.C.S.A. has increased from 163 at the time of the last convention to a total of 169. The association's financial condition continues to be excellent.

Engineering Director The report of Joseph E. Gray, engineering director of N.C.S.A., dealt largely with the need for expansion of the laboratory staff to take care of the increasing demands made by members. There has been an unusually large amount of service testing of an urgent nature and this has necessitated reducing the amount of time spent on research. The board voted to adopt the recommendation of the executive committee and authorized two additional men for the staff, one engineer and one laboratory assistant, so that vital research work need not be slighted.

The testing being done, according to Mr. Gray, is of three different types. Routine testing is done in comparatively small volume for members, consisting chiefly of routine acceptance tests which few commercial laboratories are equipped to perform. Included are the cementing value test and the test developed by N.C.S.A. for shape of particle of stone sand.

The service testing being done is usually quite complex, or requires special equipment or knowledge not readily available elsewhere. This includes tests on slipperiness, stability and durability of bituminous concrete, static load crushing tests on graded aggregate and other tests, portland cement concrete design, studies of base materials, etc.

The research work, said Mr. Gray, is and should be primarily in the field of applied research. It has as its main objective the development of information leading to improvement in methods of testing crushed stone, the development of

(*Continued on page* 117)

Wives and children also enjoyed the two-day meeting. With them are Norman E. Kelb (Cumberland Quarries Co.); Nelson Severinghaus (Consolidated Quarries Corp.); and Arthur Goff (Wallace Stone Co.).

By BURTON B. RITCHEY
Industrial Division
Minneapolis-Honeywell Regulator Co.

Electronic "hound"

prevents hot spot damage to kiln

This modern mechanical hound continuously and automatically hunts cement kiln hot spots—saving many days of production and many dollars in refractory replacements

GLOWING red hot spots on the exterior of a cement kiln signal the recurrence of one of the industry's greatest kiln problems. Under normal circumstances, by the time a hot spot on the steel shell becomes visible the interior refractory is damaged to such an extent that it must be replaced. The kiln must be scheduled for a time-consuming and expensive relining job before further use.

Universal Atlas Cement Division of U. S. Steel uses an electronic "hound" to spot these extra-hot areas, saving hundreds of dollars and days of downtime each year at its harbor plant in Buffington, Ind. The hound consists of a *Radiamatic* pyrometer suspended on cables alongside the kiln. The *Radiamatic* unit is moved by a synchronous motor through the cable suspension and scans the kiln shell from the front nose ring to back of the burning zone.

When an extra-hot—but not yet injurious—area presents itself, the scanning detector stops. It continues to "point" at that spot—much as a hunting dog points a bird for its master—until the operator resets it for continued travel.

The detector is connected to a circular chart *ElectroniK* recorder

The Radiamatic "electronic hound" unit is mounted in a plate which slides on the upper cable and is driven by the lower cable. The drive unit stops for eight seconds at the end of each pass—then reverses.

Left: Here's the hound at work on a kiln at the Buffington Harbor, Ind., plant of U. S. Steel's Universal Atlas Cement Division. For each complete rotation of the kiln, the Radiamatic detector moves six inches.

on the operator's instrument panel. This recorder is calibrated from 600 to 1,000 deg. F. When the temperature at any spot exceeds the preset limit of about 750 deg. F. the recorder trips a relay. This actuates a neon warning light on the panel and stops the traversing drive. When the operator wishes scanning action continued, he merely presses a button on the instrument panel to reset the relay.

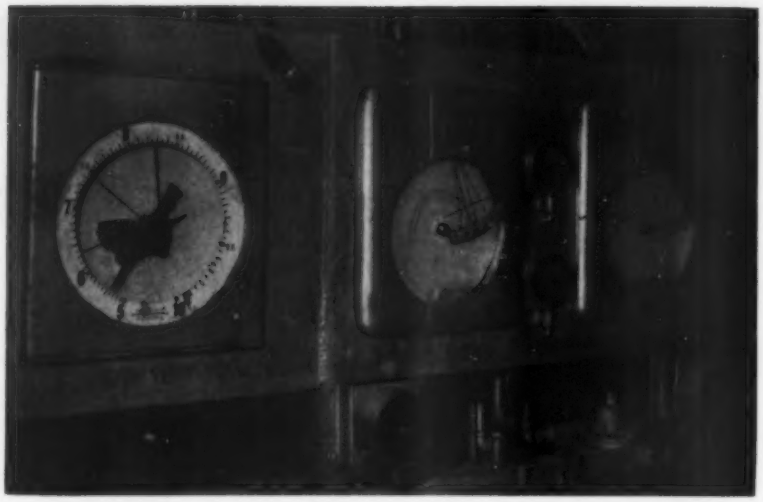
At the end of each pass across the hot zone of the kiln, the detector head pauses for eight seconds. During this pause the recorder pen is driven to the upper limit of the chart. At the end of the eight seconds, the pen travels back to the actual temperature point on the chart and . . . the *Radiamatic* detector begins another complete up and down pass.

Thus, the section of record between the two points at which the pen has traveled to the upper limit of the chart represents twice the length of the problem zone of the kiln. When the hot spot alarm goes on, the operator can locate the approximate trouble area by checking the chart. He finds the exact spot by a glance at the bottom of the halted detector.

Hot spots are usually caused by chunks of the semiliquid cement coating falling away from the refractory interior. By locating the fallaways before the steel kiln shows a glowing hot spot, the operator can take corrective action to prevent refractory damage.

Experiments aimed toward solving the hot spot problem began in March, 1957. A number of the standard visual heat indicating methods were considered. These were: crayons with calibrated melting points, color paints with temperature calibrated pigments, aluminum paints with temperature calibrated binders, and stem-dial thermometers. Both the colored and aluminum paints failed to give a close enough indication of temperature. The crayons and stem-dial thermometers gave adequate indication of the general temperature level, but were not able to cover the entire shell surface—a must for prompt, efficient location of hot spots.

The radiation pyrometer was considered to be the best temperature indicator available for the purpose. Initial experiments were made with a fixed, pedestal-mounted detector which confirmed the selection. In the range of 520 deg. F. to 970 deg. F., the *Radiamatic* detector varied no more than ±2½ percent when checked against a standard iron-constant thermocouple.



This circular chart ElectroniK recorder keeps a constant record of kiln shell temperature as determined by the traversing radiation pyrometer. The button at the lower right of the case resets the relays that stop the detector when it locates a hot spot exceeding the preset limit.

The problem of covering the entire shell was solved by the development of the traversing mechanism now in use. This mechanism gave the added advantage of stopping the detector on "point" when a hot spot was located. This, in turn, gave immediate and positive location of the affected area, thus directing the operator's attention to immediate remedial measures.

To confirm the value of this hot spot detection technique, careful records were kept of kiln 12 at mill 6, Buffington Station at Gary, Ind., from March, 1957, to November, 1958. From March to November, 1957, temperature sensitive crayons were used. During these nine months the kiln was shut down five times to replace refractory in the burning zone. From November, 1957, to June, 1958, a fixed *Radiamatic* pyrometer was used. This was focused on the area just behind the front tire of the kiln—the area of most frequent hot spots. During these seven months, the kiln was down twice. From June to November, 1958, the same *Radiamatic* unit was used on the traveling cable mechanism. The kiln was down only once during this time.

By development of this device, Universal Atlas has placed under control what has been considered for years as a normal production hazard of cement kiln operation. The application has proved so successful that Universal Atlas has placed a second kiln under control and is considering two more units for use on other kilns at Gary.

Thailand Concrete Firm Aided by I.F.C. Investment

International Finance Corporation, Washington, D. C., will invest $300,000 in Concrete Products & Aggregate Company Limited, a Thai corporation affiliated with the Siam Cement Company, Limited. The investment of U. S. dollars will help expand and diversify the firm's operations.

Concrete Products and Aggregate started operations in 1952 by selling sand, concrete aggregates and electric power. In 1956 the firm introduced the manufacture of prestressed concrete products in Thailand. The expansion and diversification program will increase the annual production capacity of prestressed concrete products from about 7,000 to 15,000 tons a year.

N.C.S.A. Directors

(*Continued from page* 114)

information on the properties of crushed stone which could be useful in the writing of better specifications, and the development of information on the best ways of using crushed stone. Such research, he said, is helpful to the membership and the entire industry and should not be neglected.

The association's field engineer, according to Mr. Gray, has been busy on field work with members, and promotional work. A movie is also being prepared on graded aggregate base course.

Engineering Consultant The problem of slipperiness of pavements was given much attention in the report of A. T. Goldbeck, engineering consultant to N.C.S.A. He called particular attention to action taken which will ultimately result in the A.S.T.M. formulating a more definite standard for the measurement of skid resistance. A new committee has been authorized by that body to study this problem, and it is believed that it will be possible to set up widely applicable standards that will be permanent so that results obtained will have long-term significance.

Mr. Goldbeck also commented on the rapidly growing use of stabilized soil mixtures for surface and base courses for roads. These mixtures are displacing aggregates formerly used. Some trouble experienced with graded aggregate base courses, due to softening under the action of water, could be overcome by the use of a small amount of cement or lime. He also predicted efforts to extend the use of lightweight aggregates to purposes other than building construction.

Manufacturers Division The meeting of the executive committee of the Manufacturers Division had 100 percent attendance, all of the seven members being present. They are: W. E. Collins Jr., chairman (Atlas Powder Co.); L. A. Eiben (Northern Blower Co.); G. D. Fraunfelder, vice-chairman (Easton Car & Construction Co.); J. M. Hume (Pettibone Mulliken Corp.); Wayne W. King (W. S. Tyler Co.); F. A. Pampel (Chain Belt Co.); W. C. Rowe, president, N.C.S.A. Also present were: J. R. Boyd, Bill N. Southworth, and Beatrice Gay of the N.C.S.A. staff. Present as honored guests were the following past-chairmen: Irwin F. Deister (Deister Machine Co.); B. R. Maloney (E. I. du Pont de Nemours & Co.); J. C. McLanahan (McLanahan & Stone Corp.).

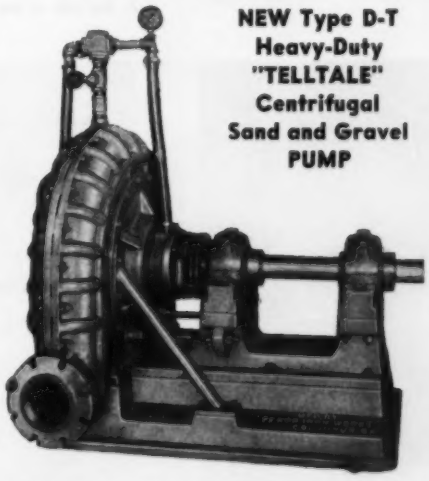
In brief reports, Chairman W. E. Collins Jr. and Secretary J. R. Boyd told of developments with respect to the machinery exposition to be held in connection with the N.C.S.A. annual convention in Chicago in February. The membership in the division now totals 118. There was also some discussion of the revision of the division's classified directory for 1960.

According to Mr. Boyd a necessary prerequisite to the coming Manufacturers Division Exposition is the development and distribution of the *Exposition Brochure* and the application form for exhibit space. This material has been mailed to all members of the division with a gratifying response to date. All available space was sold for the 1958 show and it is believed the same will be true of the 1960 show.

Bristol Silica Company will soon move its plant from the Rogue River in Jackson County, Oreg., to a new location due to the routing of U. S. Highway 99 through the present site. The new site for the plant, which crushes, washes, and screens both quartz and granite, has not yet been announced.

Production of cement reported by the Green Island Cement Company, Ltd., Hong Kong, the British colony's only producer, totalled 152,373 metric tons in 1958, according to the U. S. Bureau of Mines. This is an increase of 46 percent, compared with 104,427 tons produced in 1957.

QUICK-CHANGE "ARTISTS" LOVE THAT "TELLTALE" PUMP



NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP

CHANGING TIME, depending on the men: 6" impeller, 1 to 1½ hours; 8", 2½ to 3 hours. —6" impeller, shell liner and both faceplate liners, 2½ to 3½ hours; 8", 5 to 8 hours. It's the simple, foolproof assembly that is "Telltale's" own.

AS LOW IN DOWNTIME AS IT IS HIGH IN PRODUCTION

"Telltale" is the only pump that warns when it's time to reline. Air sucked through periphery ports causes pump to lose its prime. Pumping stops. Water leaking through the ports signals that the shell liner and the surrounding belt of packing have worn through.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

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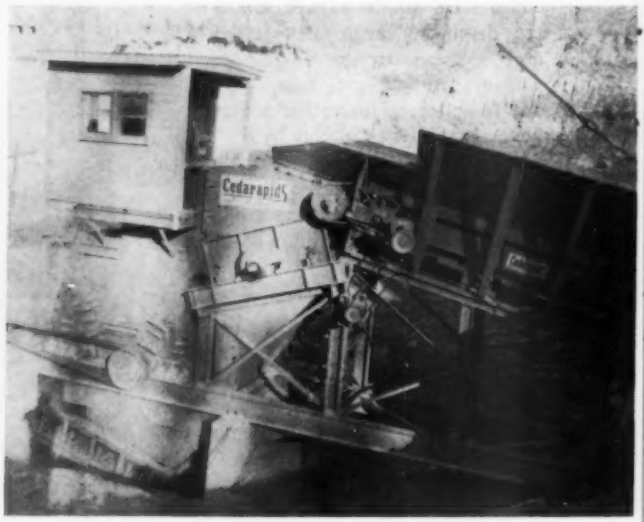
Enter 117 on card, page 177

By BUREN C. HEROD

Producer-contractor's

An overall view of the Hennessey Brothers plant site near the Cedar River. The quarry was opened (to the right) into the side of the hill.

Borrowed from the contracting equipment inventory, this shovel was used in loading out during the first months of operation.



A closeup of the primary crusher and its apron feeder. The impellers are driven by 125-hp. motors.

healthy business

requires new crushed stone plant

Output of 300-t.p.h. operation used largely in own contracts

ANOTHER ON THE SPOT REPORT

WHILE enjoying a steadily growing volume of road and general construction business, Hennessey Brothers, a long-established contracting company of Cedar Rapids, Iowa—which also produces sand, gravel, ready-mixed concrete, and now, crushed stone—faced the need for substantially increased aggregate production capacity to supply their construction activities.

Installation late last summer of a 300-t.p.h. crushed stone plant just south of Cedar Rapids has effectively closed the gap. Of simple, efficient design, with straight line flow, the new plant replaced a portable unit which the company had previously installed on the site to get an initial jump in production.

Engineering drawings and all equipment, except for a small portable conveying unit, were supplied by Iowa Manufacturing Company. The plant was erected by a Hennessey crew. Up to eight sizes of material can be produced, ranging from screenings to coarse road base aggregates, with the greater tonnage being used as concrete aggregate or road material in the company's construction contracts. Washed aggregates in the upper sizes constitute the main product.

The quarry was opened into a hillside near the bank of the Cedar River in a tract predominantly underlain by good quality limestone. A 30-ft. bench has been established by drilling 3-in. blastholes with a self-propelled Worthington Port-a-Trac drill. During initial quarrying, both standard explosives and ammonium nitrate have been used; however, consideration has been given to greater use of the latter when the face is more extensive.

Stripping of overburden is accomplished with the company's road contracting equipment—scrapers and bulldozers. This operation is performed during the off season, and a sufficient area is stripped to accommodate the crushing plant's full operating season.

For some time after the quarry was first opened, a ¾-cu. yd. Unit shovel—diverted from its usual work of excavating sewer and water lines—was utilized to load out blasted stone. This shovel will be superseded by a 1½-cu. yd. machine, and the smaller unit returned to the contracting equipment pool. A group of trucks also formerly used in construction haulage were fitted with rock bodies for use as quarry haulage units.

At the primary crusher installation, only a short distance from the working face, the trucks dump into the hopper of an apron feeder. The latter precedes an inclined vibrating grizzly from which oversize is delivered to the primary crusher, a

This hammermill and primary screen operate in closed circuit on secondary reduction.

The two finishing screens are mounted above a set of three 50-cu. yd. loading bins.

Plant Equipment Data

Unit	Size	Drive
Apron feeder	36″ x 14′	7½ hp. @ 1,800 r.p.m.
Vibrating grizzly	40″ x 6′	15 hp. @ 1,200 r.p.m.
Impact breaker (double impeller)	36 x 45	125 hp. @ 1,200 r.p.m. (two)
Conveyor No. 1	36″ x 80′	25 hp. @ 1,800 r.p.m.
Primary screen (double deck)	4′ x 12′	20 hp. @ 1,200 r.p.m.
Hammermill	40 x 33	200 hp. @ 1,200 r.p.m.
Conveyor No. 2	30″ x 45′	10 hp. @ 1,800 r.p.m.
Conveyor No. 3	30″ x 125′	25 hp. @ 1,800 r.p.m.
Finish screens (double deck)	4′ x 12′	20 hp. @ 1,200 r.p.m.
Coarse material washer (twin screw)	30″ x 18′	40 hp.

The plant's main product is processed through this twin-screw coarse material washer.

Cedarapids double impeller impact breaker.

Products of primary reduction join the grizzly throughs on conveyor No. 1, and the material is delivered to the horizontal, double-deck primary screen. The top deck retained fraction, and that from the lower, if desired, is chuted to the hammermill secondary crusher. Products of this reduction are received on conveyor No. 2, which closes the secondary crushing and primary screening circuit in discharging to No. 1 belt.

Throughs from the primary screen are discharged to conveyor No. 3 for transport to a pair of finishing screens. These identical, horizontal double-deck units are mounted above a set of three 50-cu. yd. loading bins. Feed is split to the screens from a stone box at the discharge point of No. 3 belt.

Material passing the lower deck of each screen—the smallest fraction being made at any given time—is chuted into one of the bins. The retained fractions from both screens may be chuted separately into their respective bins, or may be blended *via* blending plates preceding the chutes.

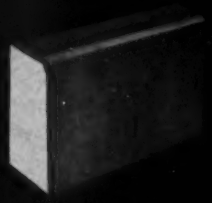
From the last bin in the row, a chute delivers the primary product to a twin-screw Eagle Iron Works coarse material washer at ground level. Water supplied to the washer's screw bearings is filtered before it is pumped to those points. Washed material is discharged into a 5-cu. yd. bin on a small portable conveyor unit, powered by a Ford engine. This conveyor delivers the product from the above bin into trucks for haul to jobsite or stockpile. Rehandling of all stockpiled materials is done with a Michigan 125A tractor-shovel. This unit has also served on standby duty in the quarry, loading haulage trucks when the larger shovel has been down for maintenance.

The other products are drawn through sliding gates on the bins for direct shipment or stockpiling. The bin used for the smallest, unwashed, material is equipped with a Syntron vibrator to counteract plugging or arching in the lower section above the gate.

Since operations were initiated, most of the plant's output has been

"MAGNECON" KILN LINERS EXCEL IN THE WORLD OF CEMENT MANUFACTURE

"MAGNECON" has gained international recognition as the leading hot zone refractory for rotary kilns. "MAGNECON" brick is a strong, dense basic refractory with high spalling resistance, low thermal conductivity and excellent resistance to chemical and abrasive attack. It is outstanding in its ability to acquire and hold a protective coating. It is made from Canadian magnesite with chrome ore under exacting chemical and physical controls.



"MAGNECON" BRICKS are now available with steel plates and cardboard spacers. Plates are keyed to the brick to prevent slippage.

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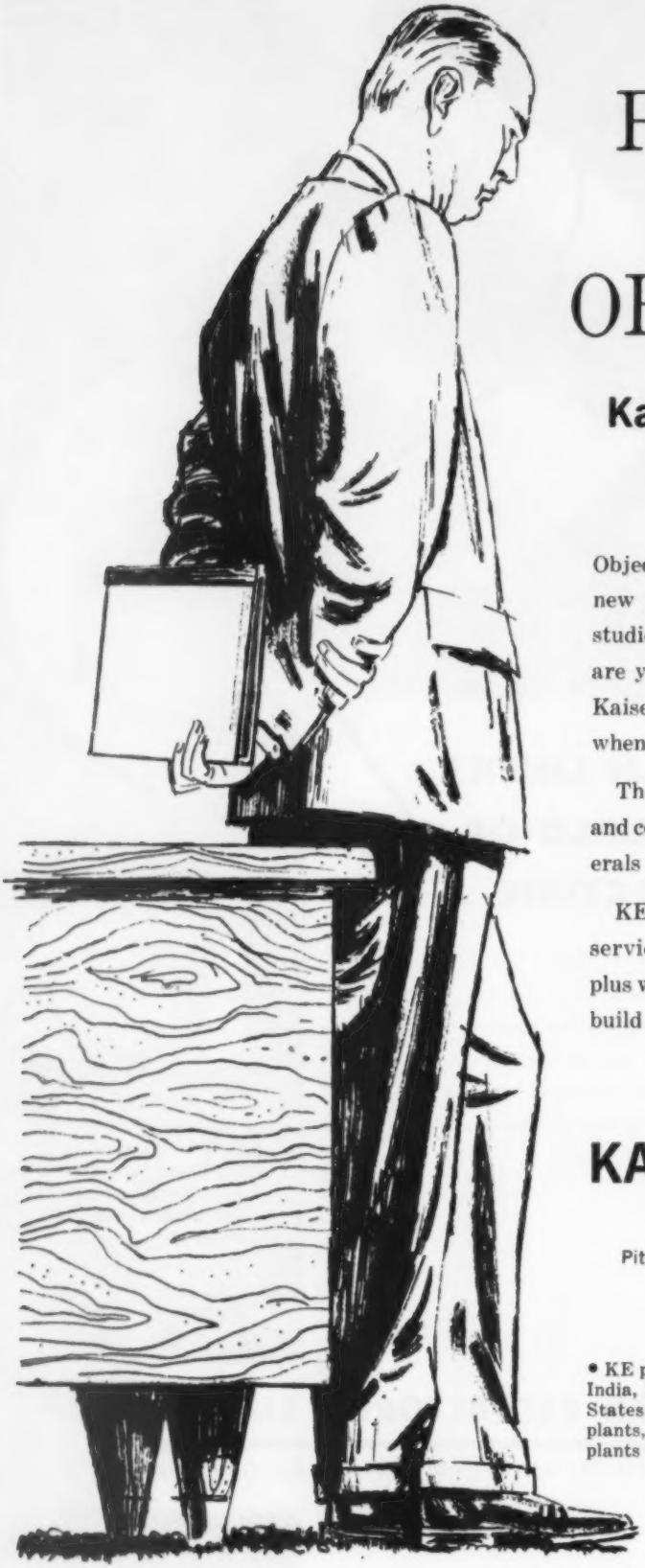

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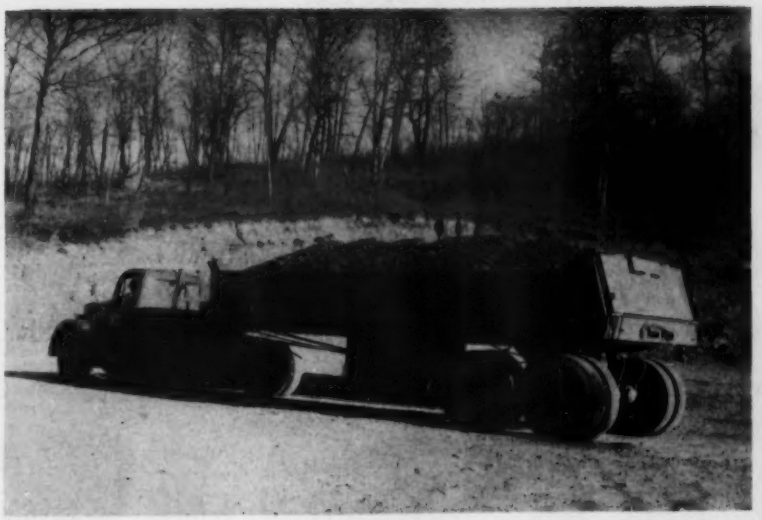
• KE projects include work in Australia, Brazil, Ghana, India, New Zealand, as well as Canada and the United States. Assignments include iron ore concentrating plants, cement plants, bauxite and alumina processing plants and diatomaceous earth facilities.

5458-M

required for the firm's own contracting. However, part of the production will probably be marketed commercially sometime in the future. A fleet of tractor trucks with Shonrock cable-dump bodies is used to haul a large proportion of the deliveries made to construction sites or to the Hennessey ready-mix concrete plant in Cedar Rapids. Loads are weighed out over a 50-ton Winslow truck scale. As a companion to the older sand and gravel workings, this new crushed stone facility has firmly boosted aggregate supply for the firm's projects.

Overall company operations are headed by a 5-man partnership—Merle, Michael, John, Robert, and William Hennessey. Production is handled by a 6-man crew under Ralph Ward, superintendent.



A large proportion of the deliveries made to construction sites, or to the firm's concrete batching plant, are made in cable-dump trucks as shown here.

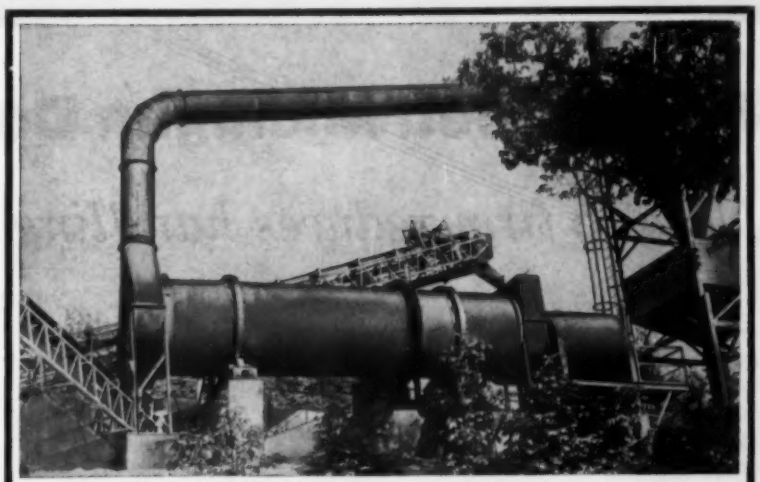
N. Y. Trap Rock Color Film Approved for Showing Abroad

A 16 mm. film in color called *From Mountain to Main Street,* released by New York Trap Rock Corporation, has been approved by the U. S. Information Agency for showings abroad. The film graphically describes the story of producing crushed stone.

The Winnipeg Fuel and Supply Company, Ltd., in Manitoba, Canada, is the first National Crushed Stone Association member outside the United States to take advantage of the opportunity. Close to 7,500 people saw the film during 1958 in showings made by New York Trap Rock and by the New York State Department of Commerce.

A $150,000 expansion and modernization program was recently completed at the River Bend Production Company's sand and gravel plant near Seagoville, Tex. Processing capacity has been increased to 200 cu. yd. per hour.

A 52-page reference work entitled *Construction Materials Statistics, 1947-1957,* has been issued by the U. S. Department of Commerce, Construction Industry Division. It contains the department's composite materials output index and 10 group indexes (in tables and charts) seasonally adjusted. Based on government and private sources, it gives details for more than 75 products by months, quarters, and years, listing production, shipments, inventories, orders, quantities, and values. Copies are available at 35 cents each, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



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This 7 ft. x 30 ft. Rotary Dryer removes excess moisture. Dryer is oil heated.

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Michigan Dozer operator has excellent view of blade.

High-speed Michigan Dozer expands

Nevada firm reduces handling costs 25%

Nacon Company, Inc is a Las Vegas firm that *doesn't* take chances when buying equipment. "Gambling belongs in the casinos!" says Tom Stewart, president of Nacon. "Before *we* lay out $50,000 or so for any big dozer, we *demand* on-the-job demonstrations.

"Our latest demonstration really proved profitable. In the hopes of boosting crusher-feed production, we tried a rubber-tired Michigan Dozer. The output of this rig really surprised us. Tests showed the 375 hp Model 380 could push enough material to our crusher to produce 400 tons of spec stone per hour—*even at distances up to 400 feet*. No competitively-priced rig came close to this production. We talked it over with our Michigan Distributor, Graid Equipment Company . . . and bought!"

The Michigan's first job was on a 9-mile excavating-grading-structures section of new four-lane blacktop Federal Interstate Highway near Las Vegas. Here, Nacon's contract called for several hundred thousand tons of roadway base and sub-base gravel (3,250 lb/yd) in three grades—select bankrun, #1 and #2 stone. Michigan's share was to dig out and push all this material to the crusher. It did . . . at an *average* work speed of 3 to 7 mph!

Production up 20 to 30%

Output averaged 400 tons per hour . . . 20 to 30% higher than Nacon's estimates with other machines . . . at a per-ton cost "about 25% lower." And since the high-speed Michigan could economically work longer distances, Nacon didn't have to move the crusher as often as with crawler-feeding. One set-up handles as much as 315,000 tons.

Bud Jacobsen, operator of the Model 380, likes the Michigan for more reasons than high production. "For one thing, it's easier riding," says Bud. "Tires absorb bumps and ruts so you can work faster on rough going. Second, you sit higher . . . have a better view of blade and of ledge and hopper edges. Third, Michigan handles easier . . . you change speeds and direction simply by moving little hydraulic levers *and without foot-clutching*. Its ease of handling, plus greater speed, adds up to *greater production than any crawler at any distance over 50 ft!*"

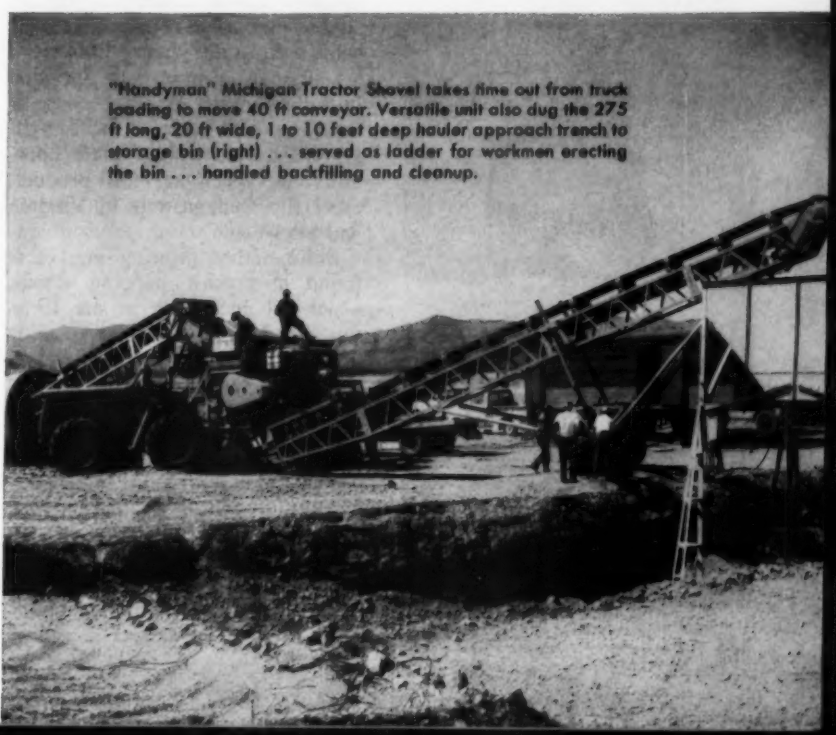
Michigan Tractor Shovel loads 20 yd trucks in 2½ minutes

But the Model 380 Dozer isn't the only Michigan drawing praise around Nacon's crushing set-up. A 2¼ yd Model 175A Tractor Shovel is attracting attention as

practical crusher feed distance to 400′

it handles stockpile loading. This unit heaps a typical 20 ton truck in only 5 passes, 2½ minutes . . . a typical 20 ton bottom-dump hauler in 4 passes, 2 minutes.

Output like this, day in and day out, speaks well of Nacon's job planning . . . also proves Michigans have what it takes to speed dozing and loading. See for yourself! Pick the rubber-tired Michigan Dozer you want to see, 162, 262, 375, or 600 hp . . . or the Michigan Tractor Shovel, 16 cubic feet to 6 cubic yards (standard SAE-rated capacity) . . . then ask your Michigan Distributor for a demonstration.



"Handyman" Michigan Tractor Shovel takes time out from truck loading to move 40 ft conveyor. Versatile unit also dug the 275 ft long, 20 ft wide, 1 to 10 feet deep hauler approach trench to storage bin (right) . . . served as ladder for workmen erecting the bin . . . handled backfilling and cleanup.

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK EQUIPMENT

2479 Pipestone Road
Benton Harbor 31, Michigan

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St. Thomas, Ontario

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New uses discussed at **E.C.S.A.** meeting

MEMBERS of the Expanded Clay and Shale Association, meeting in New York City for its mid-year convention on June 18 and 19, heard optimistic reports on the outlook for expanded clay and shale lightweight aggregates. The concensus was that the market for lightweight aggregate will continue strong in the masonry unit field, while growing considerably in other areas such as structural, precast and prestressed concrete.

At a series of open forum discussions led by B. K. Powers, chairman of the Association's Technical Problems Committee and vice-president of Virginia Lightweight Aggregate Corp. (Weblite), it was pointed out that the future potential for lightweight aggregate in structural concrete is very large, but that the accent must be on service at the actual job site. "Architects and structural engineers have come to recognize the savings that are possible because lightweight concrete means less dead load with resultant economies in steel," Mr. Powers commented, "but they expect and should have the fullest co-operation of the producer and the contractor in field work."

B. K. Powers

R. G. Hardy, president of the Association and general manager of Onondaga Brick Corp., Warners, N. Y., led the forum in a discussion of new uses of lightweight aggregate. It was brought out that lightweight aggregate is finding favor as a material for septic tank drainage. Florists are using it as a mulching agent. Many local telephone companies are now making underground conduits of lightweight aggregate concrete because they find that by its use the size of underground sections can be increased by at least one-half. Power line transmission poles of lightweight concrete are also being seen in increasing numbers, notably in Florida. Running tracks, both for people and horses, are utilizing lightweight aggregate as a base material.

Another promising use of this material is in floors of factories, where a desirable temperature of the floors has been determined to be a definite factor in reducing worker fatigue. Loose coarse aggregate, poured into cores of block walls, is being used as fill where a little more insulation is wanted than provided in ordinary walls. Again, because of the insulation value of lightweight aggregate, cold storage plant operators are specifying this product, especially fruit growers in Virginia and elsewhere.

Still another growing market is found in precast stepping stones, which are increasing in size to as much as 3 ft. square. Less cracking and more even texture of the stepping units has been reported; and with the increased use of color, better results have been obtained.

Insulation of poultry houses without heating installation is yet another expanding market. Lightweight concrete blocks are also preferred for many other farm structures, in fact, wherever a high degree of insulation

R. G. Hardy

is required for maintenance reasons. In the field of ceramic art — for sculpturing, plaque backgrounds, etc. — lightweight aggregate has found increasing favor. The material is being used in cracking plants of large oil firms, on bridge decks, overpasses, and malls where resistance to freezing and thawing is a must, and in roads where slipperiness is an especially acute problem.

The forum concluded that the future market for lightweight aggregate in the block industry will remain firm, and that it will grow in other fields. It was generally agreed that the block industry in a few short years has "come out of the cellar" and has made remarkable advances to higher standards of construction because of new and versatile shapes, colors, and glazing effects.

T. R. Berger, executive secretary, presented a report on the activities of the Association covering the six-month period since the annual meeting in Cleveland last January. L. E. Pfeiffenberger, technical director, gave a comprehensive review of the Association-sponsored test and research program which has been functioning since 1957.

Roanoke, Va., was selected as the locale of the Association's annual meeting January 28 and 29, 1960. Hotel Roanoke will be convention headquarters, and the Virginia Lightweight Aggregate Corp. will be the host firm.

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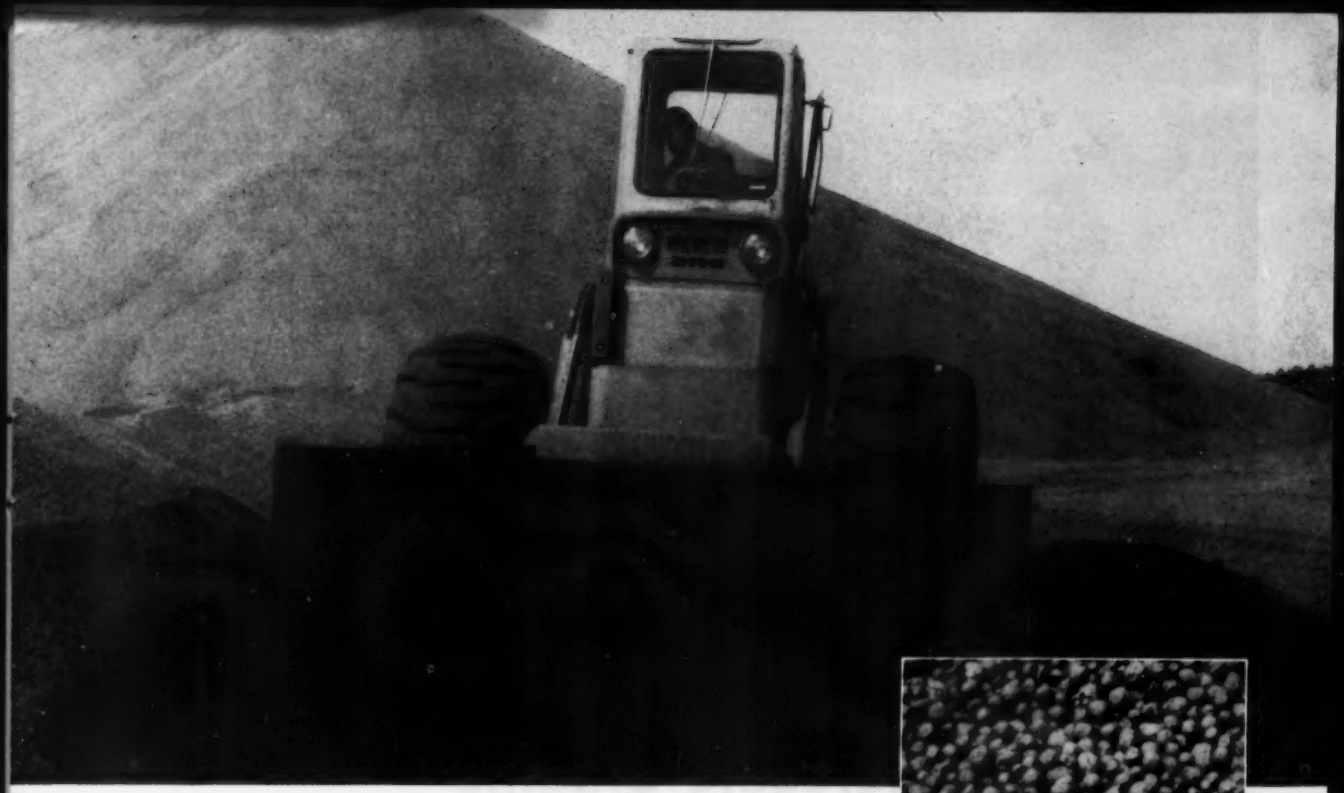

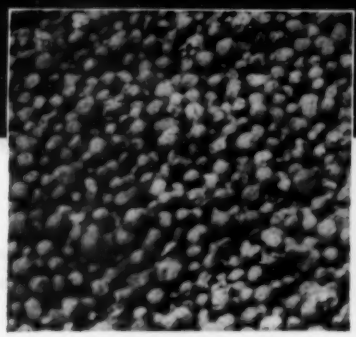

Typical Mesabi Range material: abrasive, heavy

Rubber-tired machines the only practical solution

From a distance it looks like any other stockpiled material. Then you come close and you see *this is something different*—something that combines many of the worst characteristics of sand, gravel, even rock. It's abrasive. Dead. Heavy. You've heard the name. It's *taconite!* Processed taconite! Round pellets, varying from a half-inch to three-fourths inch in diameter, blue-gray in color, 63% pure iron.

When rubber-tired machines can handle such material *successfully*—day in and day out—with rubber's obvious advantages of mobility and no track wear—that's real news for maintenance-minded firms that have almost *any sort* of stockpile or feeding problem.

This Minnesota taconite plant has *five rubber-tired Michigans.* These include a 2¼ yd Model 175A, a 2 yd 125A, and two 1¼ yd 75A Tractor Shovels . . . and the 262 hp Model 280 Tractor Dozer pictured. The Tractor Dozer exemplifies Michigan advantages . . .

Advantage No. 1—Tire Life

This 56,000 lb machine started work about a year ago. To date, its tires show virtually no wear. The machine does a variety of jobs. For example . . .

Advantage No. 2—Mobility

1. Levels the multi-million ton taconite pellet and stockpiles. Machine works on 2-to-1 and 3-to-1 slopes, has surprised men on the job with its ability to climb steep grades on loose footing.

2. Cleans around the 10-yard pellet-loading shovel. Major advantage in this operation is way Michigan's low-pressure tires don't crush the pellets . . . a real problem with crawlers.

3. Maintains haul roads.

4. Tows disabled trucks.

5. Cleans spillage around distant pellet plant. Unit gets to this assignment, 2 miles away, at 28 mph, travels under own power without waste of lowboy loading or unloading, does no damage to RR tracks or blacktop roads.

6. Cleans under hopper. Here, operator dozes normally until he accumulates load. Then he hydraulically pivots blade back, lifts material, turns and dumps outside of rail tracks.

Advantage No. 3—Dependability

Key to Michigan success, however, has been dependability! Entire power train of each machine—torque converter, power shift transmission, planetary axles—is designed and built by Clark, specifically engineered to give more usable power and traction than you've ever seen on rubber. Get the proof of a demonstration. Four Michigan Tractor Dozer models—162 to 600 hp—eight Michigan Tractor Shovels—16 cu ft to 6 cu yds—to choose from.

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Left: As seen from the top of the quarry face, this view of the Caldwell operations shows the complete primary and secondary crushing installation and the surge. With the new flow, a 100 percent jump in capacity has been realized.

Opposite page: The primary and secondary reduction stages in the Caldwell quarry. Relocation of this equipment on the quarry floor and the installation of the type of crushers used, have permitted the use of fewer but larger haulage trucks.

Aggregate Grading

Specifications Dictate

gains in capacity,

Two of the drills (background) with which 76-ft. holes are sunk over the full length of the face. Slabs in the foreground illustrate how some of the face breaks. Pieces up to 42 in. wide and 6 ft. long may be handled by the primary. Larger pieces are broken by drop-balling before transport to the crusher.

WITH THE modernization and expansion of its primary and secondary crushing stages—a program that was completed just a little more than a year ago—the Caldwell Stone Company, Danville, Ky., has realized a 100 percent gain in capacity.

Although this represents probably the most significant revision, in terms of production increase, ever undertaken by the company, it was preceded in recent years by other efforts directed toward more efficiency and larger output. From a modest beginning in 1929, the plant turned out an average of 125 to 150 tons of stone a day—a rate that

Crushing Improvements

product control achieved in program

remained virtually constant until 1937.

However, the following 20 years saw a gradual expansion, paced by a growing demand for road materials and other aggregates in the area. By 1956 the plant's crushing stages incorporated two Universal jaw crushers, a 1536 and a 2036. The primary was installed on the plant site proper. In order to maintain adequate plant feed, a fleet of five trucks was required to haul from the quarry to the primary crusher hopper.

Two factors then entered the picture. First, a contract to supply 130,000 tons of 4- to 1½-in. base stone for a federal highway construction project made it mandatory to increase the plant's capacity substantially, which was then about 1,200 to 1,500 t.p.d. The other critical factor was that increasingly rigid specifications were established by the state highway department on smaller maximum sizes and dense gradation for the road materials. These, then, provided the background for the modernization and expansion of crushing phases.

Some basic steps had already been taken—primary crushing had been relocated in the quarry, a surge installation had been provided, and the two older jaw crushers (one of which had been the primary) superseded by a hammermill and a pair of cone crushers. In addition to relocating the primary crushing station, a new and larger crusher was installed. This unit, a 3042 Universal jaw, discharged to a belt leading directly to the surge pile.

The development of more stringent aggregate top size specifications then indicated the necessity of improving the secondary reduction phase. Therefore, a single-rotor type 3620 Universal Impact Master was installed, also in the quarry, and the flow rearranged to deliver primary crusher-run to a scalper ahead of the secondary crusher which is fed the scalper oversize.

According to company officers, some very measurable cost savings, as well as efficiency gains, have been realized with the new installation. The ability of the primary to take quarry-run stone up to 6 ft. long and 42 in. wide without hangups has eliminated costs of $25 to $40 per day previously incurred in secondary drilling and blasting.

In addition, its location and capacity has allowed the use of larger but fewer haulage units. The high ratio of reduction attained with the secondary, which is delivering a product consisting of 40 percent minus 1-in. in a 1½-in. top size discharge, has meant additional operational savings.

The moderately-bedded blue-gray

Stays on the Job. Amerclad Shovel Cable has a record of long service life that keeps expensive equipment working.

(*Right*) **Designed for Rugged Work.** Amerclad Mining Machine Cables are unsurpassed for resistance to abrasion, acid mine water, oil and grease.

(*Far Right*) **Built-In Quality.** Amerclad's consistent high quality is maintained by modern precision equipment like the continuous lead press.

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What's the difference in electrical cable?

Tiger Brand Amerclad has built-in ruggedness

Of all the equipment on your job, none gets more grueling treatment than portable power cable. You drag it over sharp rocks, soak it in acid mine water, crush it, scrape it and bend it.

Tiger Brand Amerclad Cables are jacketed with flame-resistant Amerprene, a tough, hard-wearing compound that withstands oil, abrasion and constant exposure to sun, snow and rain.

One of the factors that contributes to long trouble-free life is the dynamically balanced rope lay conductors. Concentric stranded wire of the ideal size—as opposed to loosely bunched groups of fine wires—are carefully prestressed to give balanced performance and freedom from unequal elongation between conductors.

Another important factor in twin parallel cables is our "Bridgewall" construction, which actually puts a bridgewall of live Amerprene between the two insulated conductors and is an integral part of the jacket.

The same standards for materials and manufacturing practices to which the largest Amerclad shovel and power cables are built, govern the manufacture of the smallest Amerclad portable cords.

These are a few of the unseen plus values you get when you buy Tiger Brand Cables for your shovels, welders, continuous miners, drills, shuttle cars, portable tools, and other equipment. For complete technical information, write for our free book, "Tiger Brand Amerclad Cord and Cable," American Steel & Wire, Dept. 9279, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

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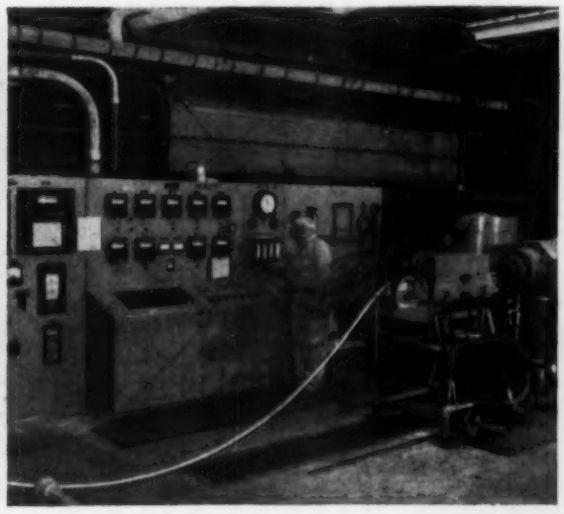


A closeup of the new secondary crusher and scalper installation. Plus 4-in. rock is scalped and fed to the secondary. Product of the latter joins the scalper throughs on the belt (background) supplying the surge. About 40 percent of the secondary product is finished material under 1 in.

limestone in the 84-acre tract has an average of 2.71 specific gravity, and Los Angeles Rattler test indicates 23-30 percent. Soundness rates up to 13.4 percent, and the full face thickness meets all federal and state specifications for concrete aggregate, road base, and rip-rap. The formation has a calcium carbonate content of 92 to 95 percent.

Blastholes are drilled 14 ft. apart, in a single line about 8 ft. back from the 76-ft. face. Three tractor-mounted Schramm Rotadrills sink 4½-in. holes to the full face depth. The full length of face is blasted at one time, using 150 lb. of 40 percent dynamite, plus 250 lb. of N-C-N for packing, in each hole. Blasting yields between 2½ and 3 tons of stone per lb. of explosive.

The broken rock is loaded out by 1¾- and ¾-cu. yd. shovels for haul to the primary crusher hopper by three 6-cu. yd. trucks. A 3,300-lb. dropball and crane are used about 5 days per month to break up slabs over 6 ft. in length.

Quarry trucks dump into a hopper above a 14-ft. by 42-in. Universal apron feeder, on which the stone is transferred to the primary jaw crusher. The latter is reducing 300 t.p.h. of material through an 8-in. setting.

Crusher-run is conveyed on a 30-in. belt to a 4- by 12-ft. double-deck Diamond screen. Separation is made at 4 in., and all scalped material above that size is chuted to the new secondary crusher. Scalper throughs drop into a stone box from which they pass to the 160-ft. surge pile feed conveyor.

In the single-rotor secondary crusher, the 4- by 8-in. feed is reduced to the top size of 1½ in. at the rate of 250 t.p.h. This product, of which about 40 percent is finished size material under 1 in., joins the scalper throughs on the surge feed belt.

From the surge, material is recovered *via* reclaiming tunnel and conveyor and transported to another 4- by 12-ft. double-deck Diamond screen where separation is made at 1 in. All plus 1-in. material is split for feed to a Diamond hammermill and a 3-ft. Symons standard cone crusher. The product of the hammermill is blended with the minus 1-in. material passing the above screen to meet the following highway department base stone specifications:

Opening	Percent Passing
1 in.	100
¾ in.	70 to 100
⅜ in.	50 to 80
No. 4	35 to 65
No. 10	25 to 50
No. 40	15 to 30
No. 200	5 to 15

Discharge from the 3-ft. cone crusher is delivered to a 4- by 12-ft. double-deck Niagara screen, which removes minus 1¼-in. material from the flow. The retained frac-

Surge pile stone is reclaimed on a tunnel belt (lower left) and delivered to the plant feed belt. Tertiary and finishing reduction is handled by a hammermill and two cone crushers. The primary crusher had originally been installed at the plant site.

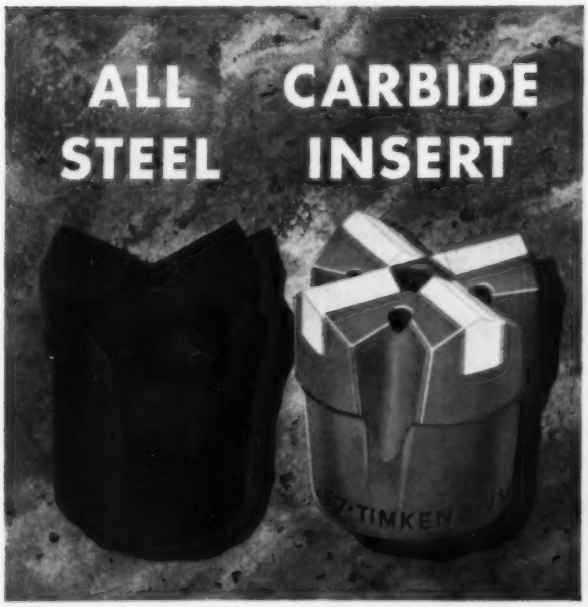
"WE DRILL UP TO 3,000 feet with each Timken® carbide insert bit"

Site: Oregon's Hills Creek Dam

ROCK: BRECCIA TUFF, HIGHLY ABRASIVE

Special report from Green Construction Co. and Tecon Corp.

Drilling blastholes for the $40,000,000 Hills Creek Dam near Oakridge, Oregon—that's when Green Construction Co. of Des Moines and Tecon Corp. of Dallas encountered Breccia Tuff, a highly abrasive rock with big angular fragments. They used Timken® carbide insert bits. With reconditioning, each Timken bit drilled from 2,500 to 3,000 feet!



Which Timken bit should you use?

The Timken carbide insert bit is the most economical bit you can use for hard, abrasive ground. But in softer ground use the low-cost Timken all steel multi-use bit. Or use both bits in changing ground—they're interchangeable in the same thread series. Dozens of different Timken bits fit the same drill steel. All are made from Timken electric furnace fine alloy steel. All have special shoulder unions that protect threads against drilling impact. Let our engineers help you choose the right Timken bit for *your* job. Phone or write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

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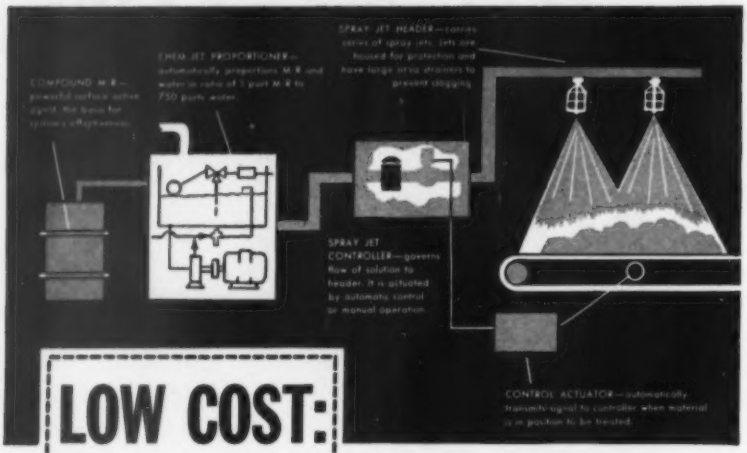
SPRAY JET HEADER—conveys series of spray jets. Jets are housed for protection and have large orifice diameters to prevent clogging.
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JOHNSON MARCH **DUST CONTROL ENGINEERS**

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tions are then fed to a 3-ft. Symons short head cone crusher which is operated in closed circuit with a 3- by 8-ft. double-deck Seco screen. This unit removes the minus ½-in. fraction, and the oversize is returned to the short head crusher.

According to V. B. Reid, vice-president, who has been associated with the Caldwell Stone Company since its organization, the new crushing installations are adequate to accommodate future anticipated demand. Since the highway department's rigid specifications on quantity and maintenance of exact small sizes require considerable operational control, Caldwell management considered high capacity and close product control essential in the reduction phases.

This led to the decision to install the type of secondary now in the flow. While opening the jaw of the primary to 8 in. speeds the discharge rate, Mr. Reid comments, there is a resultant tendency to produce slabby pieces. It was felt that attempting to feed these to a cone-type secondary would create a bottleneck that would offset the increased flow from the primary, but that the rectangular feed opening of the type of unit installed would take such material without a slowup.

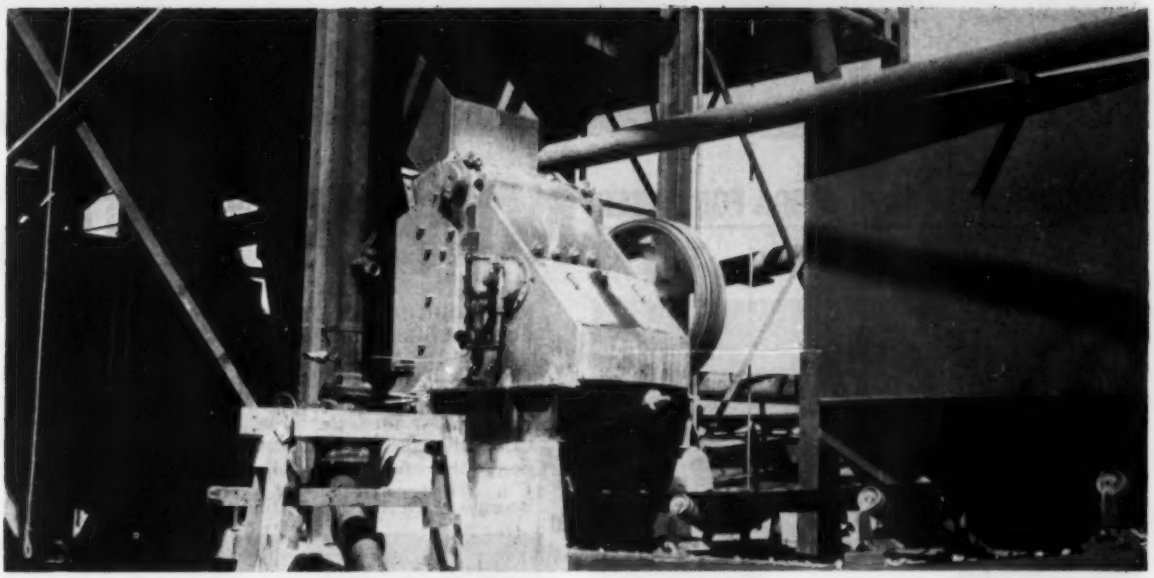
Since more than 40 percent of the secondary crusher discharge represents finished product, the cone crushers were installed in this operation as tertiary and finishing crushers, phases in which they prove of most benefit.

In the months following the completion of the new crushing installations last year, the company sold nearly 90 percent of its output for highway construction materials, and another 10 percent as agricultural limestone. As of the present, nearly 100,000 tons of dense-graded aggregate and 60,000 tons of other types have been stockpiled.

Modernization of the Caldwell crushing operations was accomplished with equipment obtained largely through the Whayne Supply Company, Louisville, Ky.

Canadian cement production figures for the first 4 months of 1959 show 1,360,165 tons, a decline of 131,288 tons from the same period in 1958. April output was down from 462,251 tons to 454,439 tons.

Greater capacity in a smaller size crusher with high speed KUE-KEN®



Kue-Ken reduces your capital investment by supplying the capacity you need in a smaller size crusher. Properly lubricated by an enclosed oiling system, Kue-Ken operates at more strokes per minute on less horsepower to make it the highest capacity crusher of all . . . size for size. Complete with pump, filter, and sealed to keep out dust and dirt, Kue-Ken eliminates costly repairs and down-time typical of crushers depending on inadequate "squirt can" lubrication methods. By "crushing without rubbing", Kue-Ken jaw plates last at least 5 times longer. Automatic flywheel release prevents damage from tramp iron. See in the chart below how your capacity requirements can be met with a smaller size Kue-Ken.

Table of tons per hour that will pass through crusher with jaws set at dimension shown when measured in the closed position. Table is based on crushing average hard, dry quartz or similar rock weighing at least 100 lbs. per cubic foot when crushed. 32 sizes available from 12"x5" to 48"x42".

Kue-Ken crusher size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	Horsepower range
24" x 12"	22	26	32	36	43	50	56					15 to 30
30" x 12"	32	35	38	42	55	70	76	85	110			20 to 30
36" x 10"	38	47	57	67	80	91	105					25 to 40
36" x 20"					70	82	90	115	135	160		30 to 50
42" x 25"					90	120	150	165	180	215	250	40 to 60

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SAN ANTONIO, TEX. . . . . Closner Equipment Co.
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SAN FRANCISCO, CALIF. . . . . Aggregates Engineers, Inc.
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Until the invention of CLUPAK Extensible Paper, paper has just been strong. It resisted the energy of impact until it ripped or tore. But now paper can also be *tough*. CLUPAK paper has a built-in stretch that lets it absorb energy that otherwise would cause it to break.

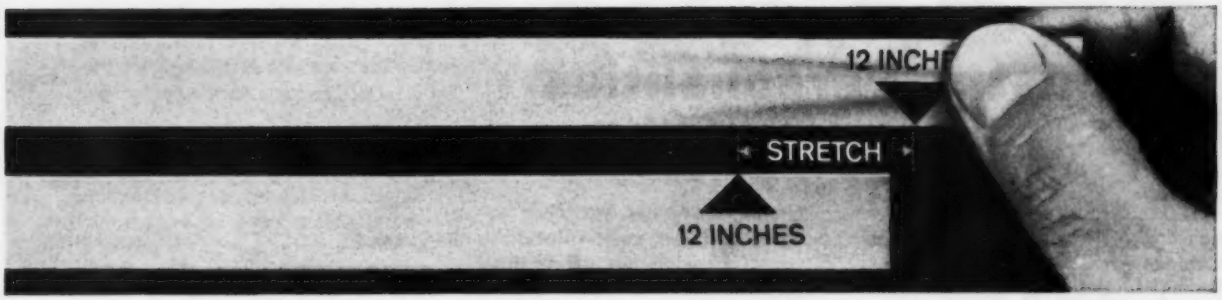
Because CLUPAK can be almost any type or basis weight

DROPPED CAN crashes through ordinary paper which lacks stretch, but bounces off CLUPAK paper of equal basis weight. Unlike creped paper which stretches easily, every fiber of CLUPAK paper resists as it stretches.

MULTIWALL SACKS perform strikingly better when made with CLUPAK paper. Bottom sacks here carry 6,000 pound weight without failing, resist roughest handling. Basis weight can often be reduced substantially, cutting sack cost.

GROCERY BAG of ordinary kraft splits, spills contents after drop, but the much tougher CLUPAK paper bag absorbs shock, remains intact.

STACK COMPARISON shows how CLUPAK flexibility enables multiwall sacks to fill better, for many products, saving up to 25% of space needed for storage and shipping.



STRETCHES

of paper, with varying controllable degrees of stretch, it transforms conventional paper into virtually a new material—one with almost unlimited possibilities.

CLUPAK stretch is already giving multiwall sacks, grocery bags, magazine wrappers, paper-base pipe and laminates, shipping containers and many other products spectacularly better performance and lower costs. And the flexibility of CLUPAK papers can also mean startling savings and advantages in many uses and situations.

But these applications of CLUPAK Extensible Paper are only the beginning. CLUPAK is the most exciting new word in paper. The "give" it adds to paper opens a new era, invites a thousand new products and design improvements. We suggest you investigate the potential of CLUPAK for your business. It will pay you to consult your paper supplier. Our licensees, who make CLUPAK paper, are listed below. ***Clupak, Inc., 530 Fifth Avenue, New York 36, N. Y.***

UNIQUE TEST machine measures and graphs far greater toughness of CLUPAK paper. Printability, surface friction, porosity and other properties of CLUPAK paper can be controlled as with conventional paper.

KEY FACTS FOR BUYERS

1. CLUPAK kraft is the same as ordinary kraft except that it is stronger, tougher and more flexible. Its built-in stretch accommodates strains that break ordinary kraft.
2. This increased toughness, for example, allows multiwall sack users to increase strength yet decrease the number of plies with resulting economies.
3. CLUPAK, INC. conducts research and development activities and advises licensees on technical matters.
4. CLUPAK, INC. permits the use of its trademark EXTENSIBLE CLUPAK PAPER only on paper which meets this company's rigid toughness requirements.

TRADEMARK "CLUPAK" is your assurance that paper will deliver remarkable CLUPAK benefits. Look for it, expect it.

BE SURE TO LOOK FOR THIS TRADEMARK

EXTENSIBLE **CLUPAK®** PAPER*

*Clupak, Inc.'s trademark for extensible paper manufactured under its authority.

You can now get CLUPAK paper and products made with CLUPAK paper from

ALBEMARLE PAPER MANUFACTURING CO.
CALCASIEU PAPER CO.
CANADA PAPER CO. *(Canada)*
CROWN ZELLERBACH CORP.
CONTINENTAL CAN COMPANY, INC.
DYNÄS AKTIEBOLAG *(Sweden)*
HUDSON PULP AND PAPER CORP.
INTERNATIONAL PAPER CO.
ST. LAWRENCE CORP., LTD. *(Canada)*
ST. REGIS PAPER CO.
UNION BAG-CAMP PAPER CORP.
WEST VIRGINIA PULP AND PAPER CO.

Industry Personalities

HAROLD F. STEPANEK, secretary-treasurer of Alpha Portland Cement Company, has been elected to membership in the Controllers Institute of America. The Institute was established in 1931 as a non-profit management organization representing all lines of business.

REYNOLD A. SANDBERG has been appointed Southwestern traffic manager for United States Gypsum's Dallas, Tex., traffic office. He will be in charge of transportation in New Mexico, Texas, Oklahoma, and Arkansas.

RAYMOND S. CHASE has been named sales manager of the Dundee Cement Company, Dundee, Mich. He was formerly associated with the Masonite Corporation.

HARRY MCGUIRK has been appointed division superintendent, Southern Division, for the General Crushed Stone Company, Easton, Pa. His headquarters will be at Glen Mills, Pa.

At the same time HARRY W. KEMERY was named superintendent of the Glen Mills plant.

PAUL H. TOWNSEND, president of the Huron Portland Cement Company, which was recently acquired by National Gypsum Company, has been named a director of the National Gypsum board. He has been president of Huron since 1953.

JOHN PITTS JR. was recently named manager of the National Gypsum Company plant in National City, Mich. He will also be in charge of the firm's newly opened Tawas City gypsum rock quarry. Mr. Pitts had been manager of the Fort Dodge, Iowa, plant before the transfer.

JOSEPH CARTER has been appointed to succeed Mr. Pitts at Fort Dodge. Mr. Carter was production superintendent there until his transfer a few months ago to the position of board plant manager of the firm's New Haven, Conn., plant.

R. W. KYLE has been appointed general merchandise manager of Canadian Gypsum Company, Ltd. He joined the firm in 1947, thereafter holding various marketing, merchandising, and sales managerial positions. Mr. Kyle will make his headquarters in the company's head office in Toronto, Ont.

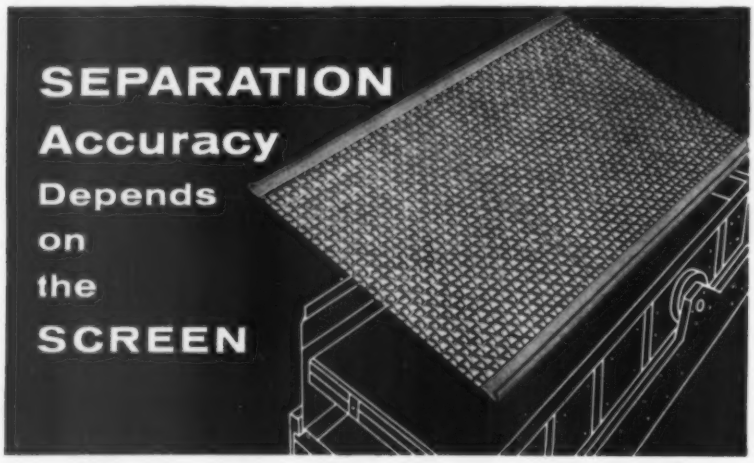
HARVEY C. SMITH has been named manager of market research for Vulcan Materials Company. Mr. Smith will be responsible for gathering and interpreting information on markets, products, distribution practices, and sales compensation and performance.

DON RIGHTENBURG was recently appointed Detroit district sales manager of Huron Portland Cement Company.

Mr. Rightenburg, who has represented the cement company for some time in the Detroit area, replaces JOHN MATTHEWS, who has retired.

WILLIAM J. CARNEY has been elected vice-president of Dolese & Shepard Company, Hodgkins, Ill., producers of crushed stone, dolomite, agricultural limestone, and ready-mixed concrete. He is the third generation of his family to be associated with the firm.

CHARLES A. HEADLEE has been named comptroller of Universal Atlas Cement Division, U.S. Steel Corporation. He replaces HENRY C. SCHMIELAU, who has retired as vice-president and comptroller after 48 years of service.



● Accurate separation of any vibrating equipment depends upon the screen. High tonnage, reduced blindness and extra strength are a result of careful screen selection. Cleveland's years of manufacturing experience provide a wide range of accurately sized weaves for long, trouble-free life. Available in Cleloy and all commercial metals for all types of mechanical and electrical vibrating equipment. Exclusive hooked edge design reduces bending, slipping and screen distortion.

See our ad in PIT & QUARRY Yearbook

Send specifications today. Ask for a free copy of our vibrating screen bulletin.

THE CLEVELAND WIRE CLOTH & MFG. CO.
3574 East 78th Street • Cleveland 5, Ohio • Telephone: Diamond 1-1832

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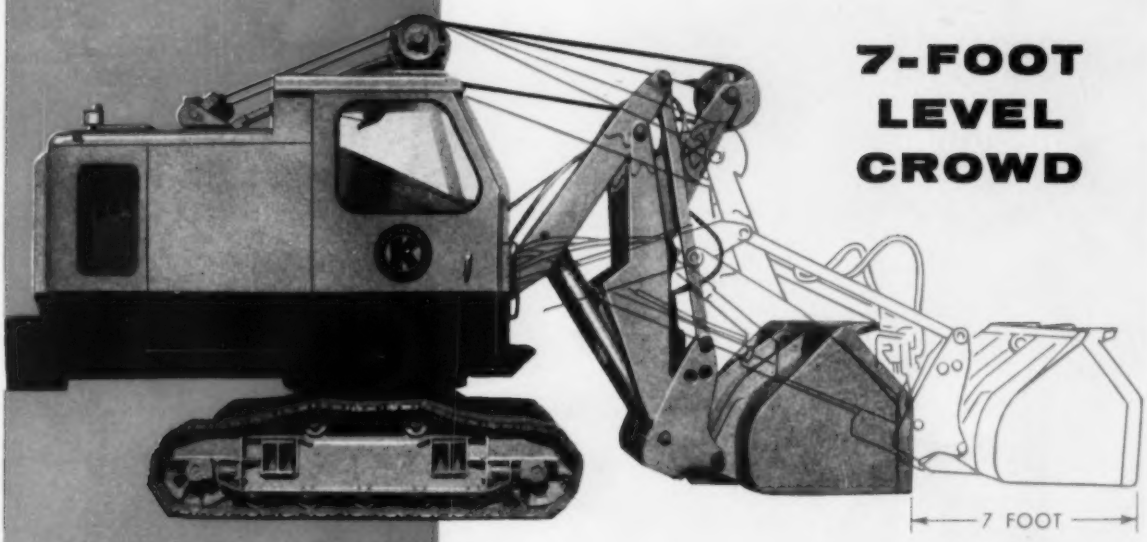
KOEHRING® SKOOPER



7-FOOT LEVEL CROWD

from "stand-still" position

Here's a new concept in excavating and material-handling equipment that combines big loader capacity with shovel efficiency — top production *with low maintenance.* Revolutionary new Koehring SKOOPER gives you a *full-revolving* loader for fast "stand-still" digging and loading. Here's the way it works: Powerful action of the twin hydraulic rams crowds the 2-yard bucket along a smooth 7-foot level cleanup without traveling from "stand-still" position — or cuts at any angle of bank slope. SKOOPER then makes a full-revolving swing, dumps load fast and clean from roll-over bucket. Then, it swings back, starts next cycle — *all without traveling.* SKOOPER'S unique "stand-still" cycle not only eliminates the usual drive-in back-out waste motion, but also cuts high maintenance costs of constant skid-turn operation. It works in tight quarters inaccessible to ordinary drive-in back-out-and-turn loaders.

SKOOPER'S wide bucket can cut evenly up a sloping bank as well as on a level grade. Crawlers can be headed into cut or parallel with bank.

Koehring SKOOPER has ample discharge height — easily loads over side or end of truck. 3 types of interchangeable buckets (rock, rehandling, and general-purpose) assure big payloads in all kinds of material . . . on all types of jobs.

See SKOOPER in action — stop-watch its fast cycle time — see for yourself how many tons it moves per hour with only 70 hp. Also check low maintenance costs and unique excavator-crane convertibility. Call Koehring distributor.

Mail to: KOEHRING Division, 3026 W. Concordia, Milwaukee 16, Wisconsin

Send us: ☐ bulletin ☐ specification sheet on revolutionary new SKOOPER

NAME..... TITLE.....

COMPANY..... DEPARTMENT.....

STREET..... CITY, STATE.....

K902 PQ

KOEHRING DIVISION OF KOEHRING COMPANY • Milwaukee 16, Wis.

Loading pit-run gravel — Fast-swinging 1-yard shovel accurately spots load "on target", keeps trucks on the move. For all its power and speed, 405 is easy on the operator. Big 26-inch main-drum power clutches require only *1/10th* the lever pull of comparable-size manual clutches — yet retain sensitive "feel" of load. Pays off in less operator fatigue — more output with all attachments: shovel, hoe, clamshell, dragline, lift crane and piledriver.

KOEHRING

DIVISION OF KOEHRING COMPANY

Milwaukee 16, Wisconsin

Koehring excavators, cranes also manufactured in:
ENGLAND • SPAIN • JAPAN

In Canada:
KOEHRING-WATEROUS LTD.
Brantford, Ontario

2 new products for mining and quarrying: (1) Koehring® 205 SKOOPER — a full-revolving, free-swinging 2-yard loader that crowds, hoists, swings, dumps, then swings back to digging position *without traveling*. Crowds bucket along a 7-foot level cut from *"stand-still"* position, or digs at any angle of bank slope. (2) That big hauler is the new Koehring *10-yard* Dumptor® — with 2-way controls, pivoting seat, 20.8 mph speeds in *both* directions for *no-turn* hauling. 30,000-lb. payload capacity. 28½% gradability. *Instant* gravity-dump or *controlled* gravity-dump by hydraulic cylinders.

Rocky overburden on steep, mountainous site made stripping conditions as tough as they come at this coal mine. No job for ordinary equipment! So, mine owner brought in a Koehring heavy-duty 1205 rock shovel, with results shown above. It's equipped with 3-yard dipper on 30-foot rock-type boom. Also available as *high-lift shovel* with 2½-yd. dipper on *50-foot* boom; 3-yard on *40-foot* boom.

Long-reach dragline loads sand and gravel out of deep, water-filled pit. It's the Koehring 805 — a special-size that fills an important production gap on many mine and quarry operations. Depending on weight of materials, 805 handles 2 to 3-yard dragline bucket on 50 to 150 feet of boom. What's more, this high-production 805 readily converts to clamshell crane, 52-ton lift crane, or 2-yard shovel.

Always on the go — Wherever there's a heavy load to lift, machinery to install, materials to stockpile, big mobile 545 truck crane is *there* in a matter of minutes — puts all scattered assignments on a fast "work-and-run" basis. Lifts up to 45 tons with 40-foot boom *at 15-foot radius!* Angle indicator on boom, plus reference guide in crane cab, quickly show maximum safe lift capacity for any length of boom and angle of boom being used.

Check the chart — pick the size, type that best fits your needs — then call Koehring distributor for demonstration.

Quick facts on KOEHRING WORK CAPACITY:

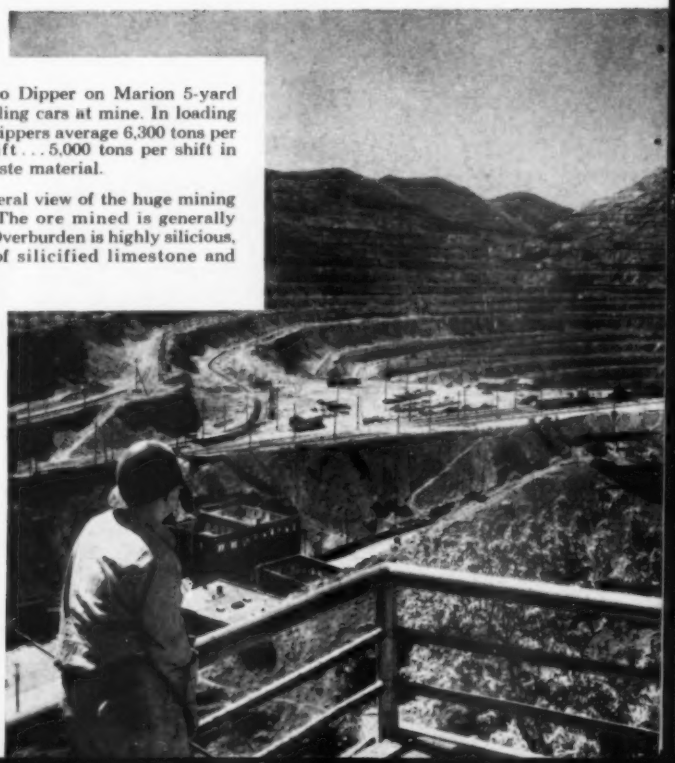
MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER			
205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
305	3-axle truck, or 18 mph Cruiser	50,000 lbs.	at 12-ft. radius
330	3-axle truck	60,000 lbs.	at 15-ft. radius
435	4-axle truck	70,000 lbs.	at 15-ft. radius
545	4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
205	½ Cu. Yd.	20,000 lbs.	at 10-ft. radius
305	¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
405	1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
545	(Crane only — 85% rating)	90,000 lbs.	at 12-ft. radius
605	1½ Cu. Yds.	72,300 lbs.	at 12-ft. radius
805	2 Cu. Yds.	104,200 lbs.	at 12-ft. radius
1205	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

K933

How AMSCO helps you MOVE

Left: Bucyrus Erie 88B shovel used for rock excavation at Conduit #2 South. Dipper equipped with Amsco Simplex Teeth.

Right: General view of Conduit #2 South project showing rocky terrain in which Gull & Defelice Construction Co. operates.



Left: Amsco Dipper on Marion 5-yard shovel, loading cars at mine. In loading ore, these dippers average 6,300 tons per 8-hour shift . . . 5,000 tons per shift in working waste material.

Right: General view of the huge mining operation. The ore mined is generally porphyry. Overburden is highly silicious, composed of silicified limestone and quartzite.

MORE TONS PER DOLLAR

Read these user reports on how AMSCO Dippers and Teeth perform in rugged digging service

ON THE NIAGARA POWER PROJECT

40,000 YARDS OF ROCK HANDLED BEFORE AMSCO 2-PART TEETH NEED REPLACING

Gull & Defelice Construction Co. is working on Section 3 of the powerhouse conduit project – excavating 140 feet deep, almost entirely in rock. All five power shovel dippers on the job are now equipped with Amsco Simplex 2-Part Reversible Teeth.

These dippers work *16 hours a day, 6 days a week for 2 weeks—handle approximately 40,000 yards of rock*—before tooth replacement is required.

Says Mike Cazzolla, Equipment Superintendent, in talking about the Amsco teeth: "They're built rugged and take a lot of punishment from the rock. We get longer wear out of them because we can turn them over." He's referring, of course, to the reversible tip feature.

John Cazzolla, Master Mechanic, adds the important fact that *they can replace these teeth in ten minutes with no trouble.* This feature, together with the longer wear, means important savings in downtime.

AT ONE OF WORLD'S LARGEST COPPER MINES

THEY USE AMSCO DIPPERS ...FOR HIGH-SHOCK, HIGHLY ABRASIVE DIGGING

This huge copper mine operates the largest collection of big power shovels (5 yards and up) in the world. For this rugged service they use Amsco dippers to strip off extremely abrasive overburden ... handle waste material ... and load copper ore. These are cast manganese steel dippers – built for toughness, high abrasion resistance and long service life.

For rugged digging anywhere

... wherever high impact and abrasion are problems, you'll "move more tons per dollar" with Amsco Manganese Steel Dippers and Simplex 2-Part Reversible Teeth. See your power shovel equipment dealer for sizes and types available. Or write us direct for technical bulletins on Amsco Dippers and Simplex 2-Part Teeth.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

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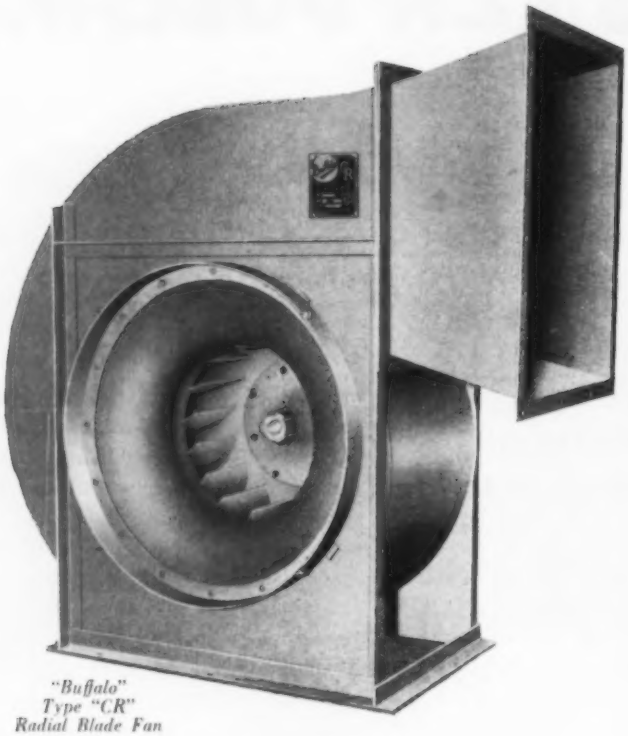
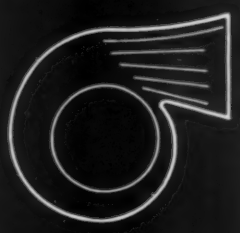
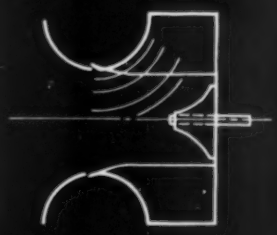


"Buffalo"
Type "CR"
Radial Blade Fan



Gradually divergent outlet minimizes turbulence . . . obtains peak static pressure conversion. Result is reduced housing wear, increased efficiency.



Design of the deep die-formed inlet and wheel flange reduces abrasion to a minimum. Mating sections form a true half-circle with no irregularities. Resultant smooth air flow reduces wear, provides top performance.

ABRASION RESISTANCE OF "CR" FAN REDUCES MAINTENANCE-REPLACEMENT COSTS

Where you need a high volume, high pressure fan that will stand up under the most severe heavy-duty industrial jobs, especially where abrasion is a problem, the "CR" will give you the most for your fan dollar.

The "Buffalo" Type "CR" Fan's superior design, heavy gauge construction and painstaking workmanship insure optimum performance during a long life of dependable service. Its high capacity characteristics often permit substitution of a smaller fan for many direct-connected applications. This can save many dollars on initial fan costs.

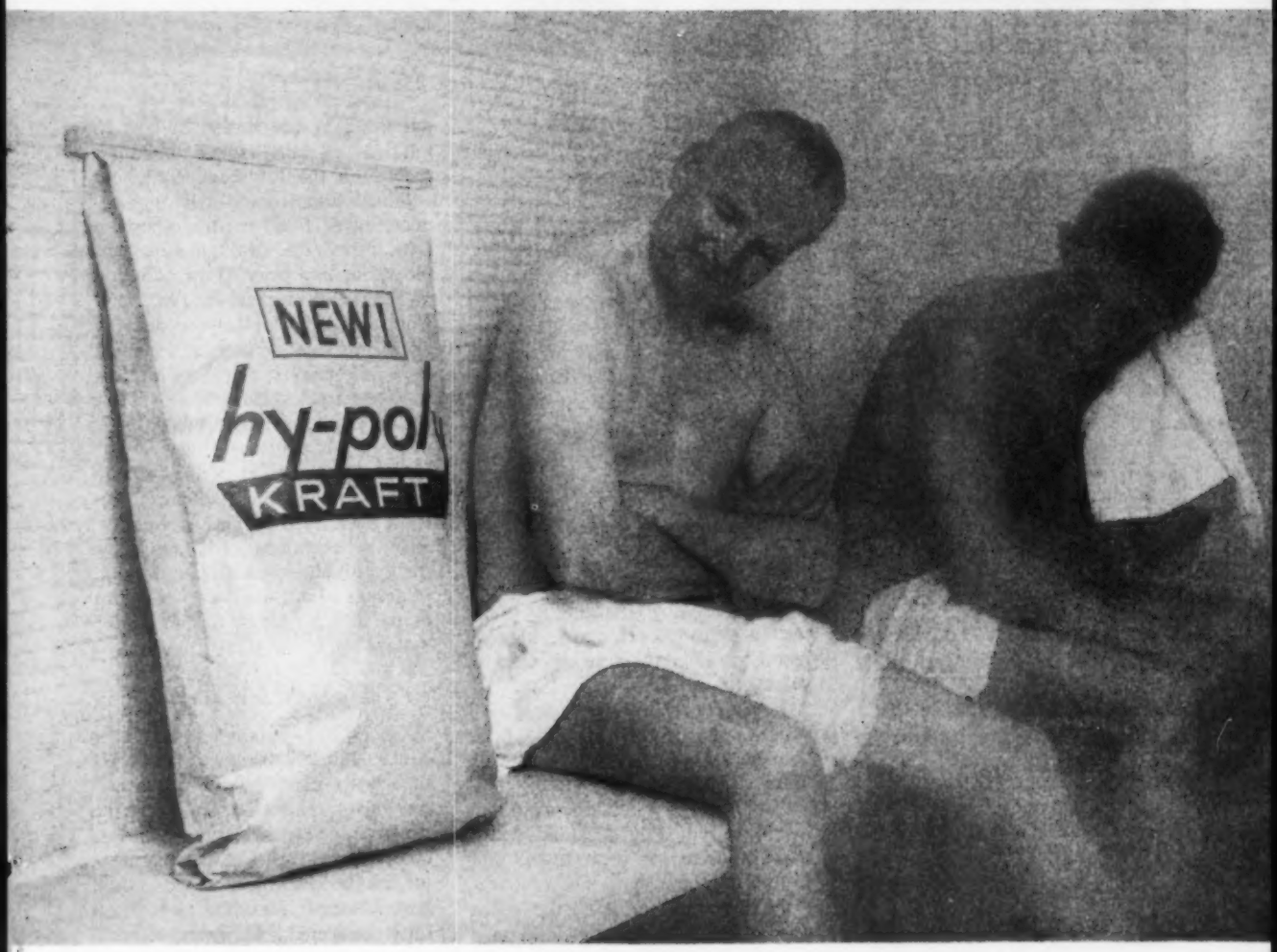
The "Buffalo" Type "CR" Fan offers many advantages for your most punishing air moving applications. Contact your nearby "Buffalo" engineering representative, or write for Bulletin FD-205.

"Buffalo" Fans give you the exclusive "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life.

BUFFALO FORGE COMPANY
Buffalo, N. Y.
Buffalo Pumps Division, Buffalo, N. Y.
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

Now International Paper saves you $5 to $16 per thousand PE multiwalls!



Read why new humidity-proof "Hy-poly" kraft makes medium and low-density polyethylene sheets extravagant!

THE multiwall bag you see taking a Turkish bath in our picture contains *calcium chloride*.

We steamed this new Bagpak® multiwall in 95% relative humidity at 120° F. for 48 hours. (Unprotected, under these conditions, this chemical takes on 2½ times its weight in water in about an hour!)

But when we opened up the bag, the thirsty crystals spilled out as though they had been stored on the Sahara!

And Bagpak's new Hy-poly kraft *saves you money*. You stand to save from $5 to $16 per thousand multiwalls!

That's because new Hy-poly kraft is so superior to medium and low-density PE sheets that you get equal, if not greater, moisture-vapor protection from a coating approximately *half as thick!*

Extensive laboratory tests prove that this dramatic new barrier sheet is superior in *every way*. Write us today for samples.

See how calcium chloride protected by Hy-poly kraft Bagpak, pours after 48-hour steam bath!

Bagpak Division **INTERNATIONAL PAPER** New York 17, N.Y.

"THIS LUBRICANT PRACTICALLY ELIMINATED BEARING REPLACEMENTS"

Says- C. O. SPARKS, INC.
& Mundo Engineering Co. of Los Angeles, Calif.

"Prior to using LUBRIPLATE, we were replacing shaker screen bearings within 60 to 120 days due to lack of or faulty lubrication. Since we started using LUBRIPLATE seven years ago, we have only replaced two shaker screen bearings and these because of natural wear. We now use LUBRIPLATE for general lubrication throughout our plant."

W. T. Ellington, President
Mundo Engineering Co.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

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Legal Decisions

On Industry Problems

By LEO T. PARKER

Attorney at Law
Cincinnati, Ohio

SELDOM have the higher courts in a predetermined short period of time rendered so many interesting and informative decisions as during the last few weeks. I shall briefly review these outstanding law suits.

Can't Extend Operations

Last month a higher court held that if a corporation violates a zoning ordinance by enlarging its plant over a period of 16 years, it must reconstruct its plant as it was 16 years ago.

For instance, in *Town of Seekonk,* v. *Anthony,* 157 N. E. (2d) 651, the testimony showed facts, as follows:

From April, 1942, one Anthony had been removing sand and gravel from a large lot in a town, and processing these materials.

In December, 1942, the town passed an ordinance restricting the area for residences. Anthony continued to carry on his usual business and from time to time made certain improvements to his plant. Recently the town filed suit and asked the court to enjoin him from carrying on a ready-mix concrete business in alleged violation of the town zoning law.

The higher court held in favor of the town and entered a decree requiring Anthony to remove entirely certain new steel bins and restore the aggregate bin capacity for sand and gravel to no more than it was in 1942; to remove all parts of any of the steel bins and all mechanical equipment and accessories which reach to a greater height than is permitted by the zoning by-law; to remove all the small buildings placed on the lot after 1942; and enjoined him from distributing cement on or from the lot otherwise than in bags and in the manner employed by him prior to the adoption of the zoning by-law in 1942, and from using the lot for the delivery or sale of sand, gravel, and cement to mobile mixers, or otherwise than to dump trucks and vehicles of the size and general type used in 1942.

Also, this court held, as follows:

"The replacement of the wooden platform for loading and storing cement by a steel bin and accessories, and the additions of wholly new small buildings and a heating plant to permit winter use, were violations of the precise terms of the zoning by-law."

Damages are Limited

Generally speaking, the higher courts hold that if a property owner breaches a contract with a contractor, or other person, or stops the construction work before the job is completed, he must pay the contractor the full amount the latter would have earned had the job been fully completed. However, a recent higher court reversed this old and established law.

In *Furst* v. *Board,* 155 N. E. (2d) 654, the testimony showed that the board of education decided to build two schools. It made a contract with Armstrong, Furst & Tilton to pay the firm for services in the construction of the schools.

The board of education did not construct the schools. In the meantime, an entire new board had taken office, and it employed another firm to perform the necessary services. Then the firm of Armstrong, Furst and Tilton sued the county for $37,176.54, the amount they would have earned if the original board of education had not abandoned the

contemplated construction of the schools. The lower court awarded the firm this amount of damages.

The county appealed to the higher court which reversed the lower court's verdict, holding that the firm could recover only a small fee for work actually done in preparing the plans and specifications. This court said that article four of the contract provides that if any work designed or specified is abandoned or suspended the firm is to be paid for the service rendered it.

The court said further:

"We think that this clause plainly means that upon abandonment the firm is entitled to compensation upon the work done up to the time of abandonment or suspension but that the abandonment or suspension is not a breach of the contract permitting it to recover damages for loss of opportunity to complete the contract."

Testimony Not Admitted

Last month a higher court held that a jury need not consider irrelevant or non-illustrative testimony when deciding whether blasting operations caused damages to nearby residences, or other property.

In *Taylor* v. *Sidwell,* 155 N. E. (2d) 727, the testimony related the facts as follows:

An owner of a residence sued a quarry company for damages to the home allegedly caused by blasting operations done two years previously.

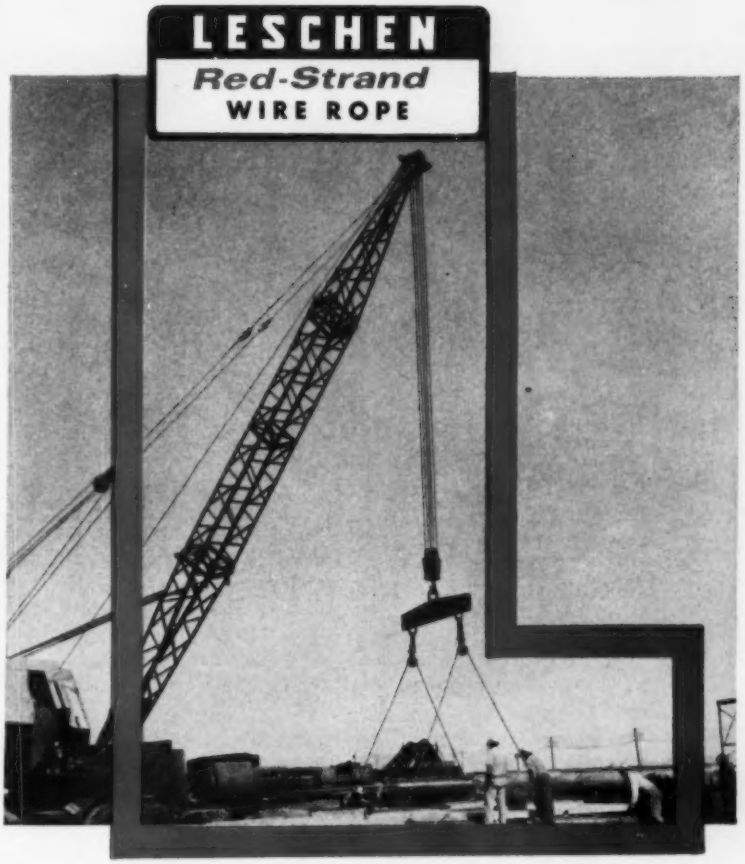
The testimony showed that the quarry was located thirty-nine hundred feet from the residence. In the meantime the quarry company had moved its operations at least one thousand feet farther away from the residence, and all of the mineable product had been blasted and extracted from the old part of the field.

The firm had a seismologist testify about an experiment conducted two years after blasting operations at the old site of operation. The experiment tended to prove that the blasting operations had not damaged the residence. The higher court rejected this testimony on the grounds that only testimony and evidence concerning the actual operations and use of explosives will be considered.

The higher court held the quarry company liable for damages to the residence, saying:

when the going gets rough-

give 'em "L"



When the load is on the crane, you'll be glad you rigged with *Leschen*—the wire rope that's the same top quality in every foot of every reel. The new Leschen wire mill is designed to deliver exactly that. New machines . . . new processes . . . exclusive new continuous-flow technique—all as modern as tomorrow. Try Leschen Red-Strand Wire Rope now and see how its uniform quality makes your operation safer, your replacement time farther in the future. Make your next order Leschen! *Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.*

LESCHEN WIRE PORTER ROPE DIVISION

H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

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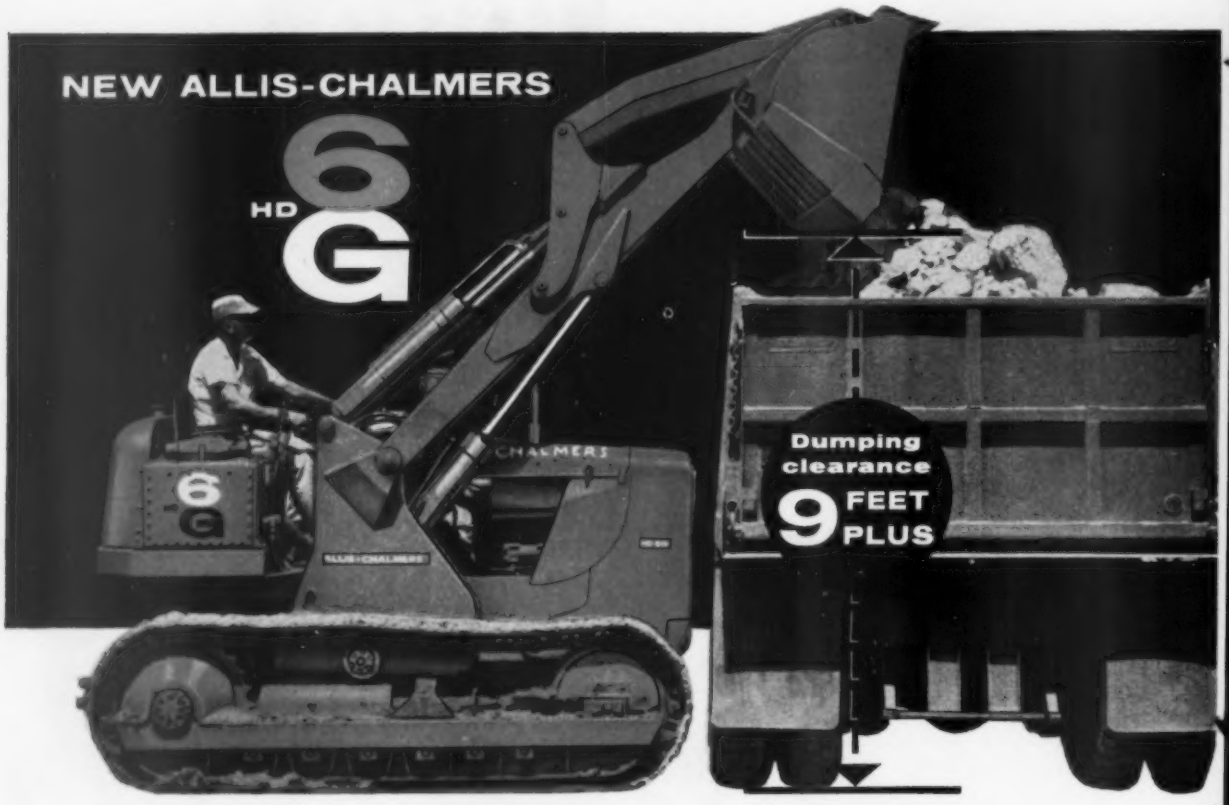
new slant in tractor shovels . . .
everything you need for

BIG PRODUCTION AT



What you want most in a 1½-yd tractor shovel is here. The new 6G gives you advanced-design features that mean extra productive ability you can *measure*—plus new comfort and convenience for the operator, servicing simplicity and big-tractor strength.

But this is only half the story. Your Allis-Chalmers dealer can tell you much, much more—and *prove* it, too! Why not let him set up a demonstration *now*, on your tractor shovel job? Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Height with a bonus in reach

With as much as a foot more dumping height than the maximum for ordinary tractor shovels, the 6G reaches 'way out to dump over the center of big, sideboarded, 12-yd trucks. This height-and-reach combination pays off on other jobs, too—like stockpiling or loading out over the sides of excavations.

move ahead with **ALLIS-CHALMERS** . . .

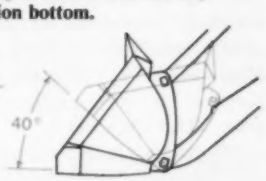
LOW COST

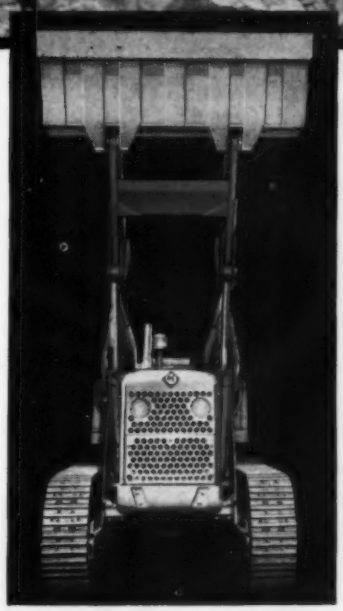
- 72 net engine hp
- 21,000 lb
- 1½-yd general purpose bucket
- 40° bucket tip-back
- Fast reverse to 4.1 mph
- Rugged "in-line" booms and linkage
- Best dump height, reach in its class

Super pry-out action

The new 6G's curved-bottom bucket puts a 10¾-ton force at the cutting edge. This unique "rolling-leverage" action is far more effective than the fixed, toe-and-heel principle of an ordinary, shoe-type bucket bottom. You can break out stubborn boulders, stumps and old pavement easily—get *full* loads *fast* in hardest materials.

Bucket tips back 40° on curved, box-section bottom.





Speed with stability and control

Shift from any forward speed to either reverse speed with a single lever—choose the *right* speed for every tractor shovel function. Powerful hydraulics put big loads right to the top, then bring the bucket down in a smooth, swift cycle. Nearly seven feet of track on the ground . . . positive, accurate controls . . . and new "down-slope" visibility let you handle the bucket and tractor with unheard-of balance and precision.

"In-line" strength

Booms and linkage are twin towers of solid-steel strength, straddle-mounted on wide-spaced pivots in the double-walled side frames. Lift and dump cylinders operate in exactly the same line, put dependable hydraulic power to work *straight from the shoulder.*

. . . power for a growing world

"In considering matters of evidence and of law in a particular case, such as here, even though each case stands on its own bottom, it is important and this court seeks to relate and define its position on questions of law and facts or circumstances to which the law may or may not be applicable, in such a way as to afford as consistent a course as is humanly possible in the approach of all similar situations that have arisen or may arise. Experiments, to be admissible in evidence, must be made under conditions practically identical with the conditions that they purport to illustrate."

Corporation Liable for $50 per Day

Recently a higher court held a concrete corporation liable for payment of $50 per day, plus ordinary damages, for nuisance operation of its plant.

In the case *Daddino* v. *Builders Concrete Corporation,* 334 Pac. (2d) 1067, the testimony showed that the Builders Concrete Corporation operated a transit-mix concrete plant in a city on property adjacent to the poultry ranch and residence of one Daddino. The latter sued the Builders Concrete Corporation for heavy damages, claiming that operation of the plant reduced the number of eggs usually laid by his chickens. He also claimed that operation of the plant disadvantageously affected enjoyment of his home, and also damaged his fruit trees.

The lower court decided that the operation of this plant constituted a nuisance and permanently enjoined the Builders Concrete Corporation from continuing the operation of its plant together with damages in the sum of $6,600. Later Daddino and Builders Concrete Corporation entered into the contract to enable the latter to continue its concrete business while it was establishing a new plant at a new location. The contract provided that the Builders Concrete Corporation would keep nuisance of its operation to a minimum and in the event it operated past October 17, 1956, it would pay Daddino the sum of $50 per day as liquidated damages.

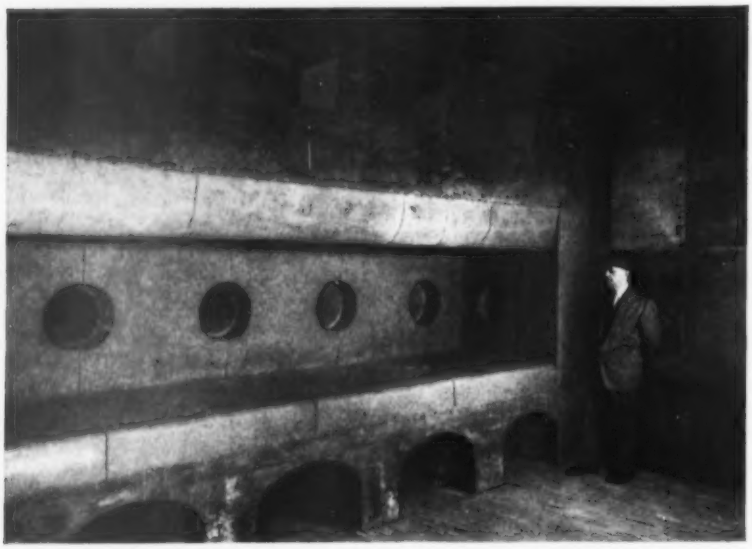
In subsequent litigation, Daddino proved that the Builders Concrete Corporation continued its operation after October 17, 1956, until December 2, 1956. The lower court ordered the corporation to pay to Daddino the sum of $2,750. The higher court approved the verdict, saying:

"The record amply supports the lower court's findings that the provision in the contract for $50 per day to respondent (Daddino) under the circumstances was a fair compensation for respondent's loss, and said provision should be construed as a valid enforceable provision for liquidated damages."

No Witnesses to Accident

A higher court has rendered an unusually important decision which clearly answers a legal question often asked by officials and employees of nonmetallic corporations. This question is:

"If there are no witnesses to a motor vehicle collision, on what basis will a court render its decision as to liability and responsibility for the accident?" (*Turn to p.* 152)



600,000 brick/day furnace Sets 4½ Year Service Record

"Excellent constant-service record . . . speaks well for Plibrico design, construction and products," states Brick Co. Vice President

Even after 4½ years of severe service in the huge combustion chambers and burner section, where temperatures reach 2000° F., only minor maintenance was needed. This was in the primary combustion chamber where the punishment is most extreme.

"Zoned" one-piece lining is economical. By matching the type and grade of refractory to the temperature and operating requirements for each furnace zone, Plibrico engineers give you not only better linings but lower costs. There is a Plibrico plastic or castable refractory that is just right for each zone.

One-source guarantee. Plibrico engineers, working with Plibrico materials, provide centralized responsibility . . . assure complete integration of installation and specification. Your local Plibrico Field Engineer will be glad to tell you more about this "package" service.

SEND FOR CATALOG 73 showing how other firms reduced maintenance cost in drying, calcining and processing furnaces.

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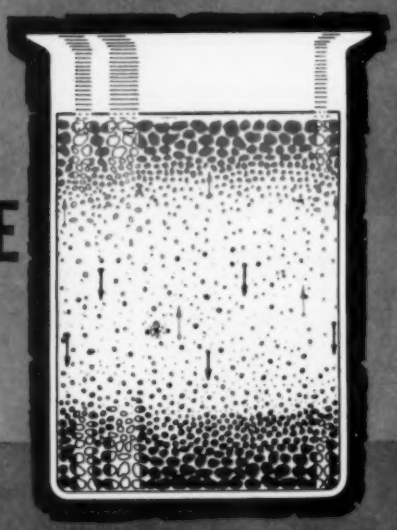
THE WEMCO MOBIL-MILL PLUS WEMCO EXPERIENCE WILL GIVE YOU HIGH-VOLUME SPECIFICATION AGGREGATE AT LOW COST!

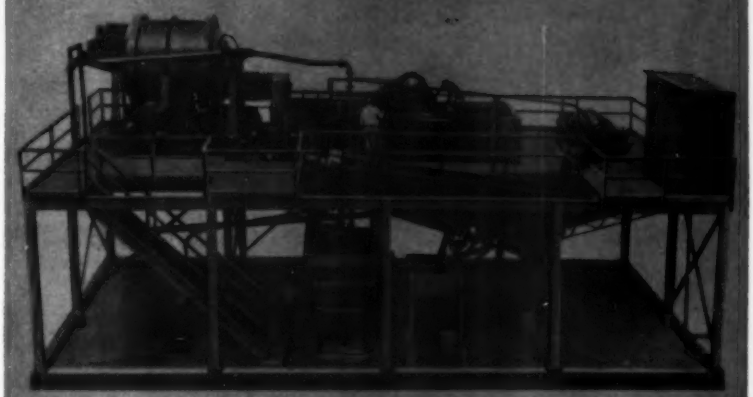


The heavy media separation process literally floats away undesirable shale, chert, clayballs, coal and other materials, produces volume, premium aggregate at low cost.

And the HMS equipment most often turned to for proved specification production is Wemco. Wemco's Mobil-Mill is the only pre-fabricated packaged plant backed by such long experience—nearly 20 years—with a record of over 150 installations. The Mobil-Mill is ready for on-the-site installation and operation without a break-in period.

Requires, in most cases, no additional labor, minimum supervision and maintenance.

Ask for complete information on the Wemco Mobil-Mill and other equipment now.



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650 Fifth St., San Francisco, Calif.
and throughout the world

For instance in *Gilder* v. *C. & C. Corporation,* 90 N. W. (2d) 828, the testimony related these facts:

One Gilder's automobile and a tractor of the C. & C. Corporation were involved in a collision described as "head-on". Gilder sued for resulting damages. During the trial Gilder testified that he saw the tractor approach from the south on the east side of the center line, but when it was about 50 feet distant it took an angle right at him, crossing over the center line of the highway, and a big crash occurred. There were no witnesses to the collision, and if Gilder's testimony was correct the C. & C. Corporation would have been liable in heavy damages. However, the higher court refused to award Gilder any damages because photographs showing the location of skid marks, debris, and the two vehicles immediately following the accident were inconsistent with Gilder's theory that the accident happened on his side of the highway and that the tractor had crossed the center line of the highway. This higher court also held that, under the circumstances, a jury's verdict against the C. & C. Corporation would not stand, saying:

"Plaintiff (Gilder) has no constitutional right to have a determination of facts by a jury inconsistent with the undisputed physical facts of the case. On the contrary, such facts overcome testimony inconsistent therewith and are controlling of decision."

$10,000 Damages for Driveway

A new higher court has held that where an old street or highway is improved to the detriment of a property owner, the latter will be awarded adequate damages.

For example, in *Spring County* v. *Bowman,* 318 S. W. (2d) 603, the testimony showed that a pre-existing street was lowered about three feet by a county in front of a business building and plant.

The higher court awarded the property owner $10,000 damages although none of its real estate was taken and a reasonably good approach and driveway was made by the county from the street. The court said:

"A landowner who is damaged by a change in the grade of the highway is protected by the constitution to the same extent as one whose land is actually taken."

Lowest Bid Held Valid

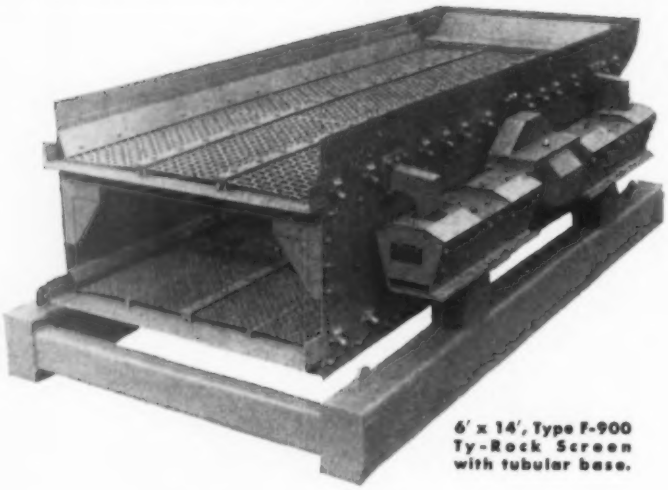
The higher court always holds that bids for municipal contracts must substantially comply with all requirements contained in statutes, charter provisions, ordinances, and advertisements. However, a recent higher court holds that certain unimportant irregularities will not make invalid the contract given to the lowest bidder, if no fraud is involved.

For example, in *Nielsen* v. *City of Saint Paul,* 88 N. W. (2d) 853, these facts were proved:

A man named Nielsen, a taxpayer of the city of St. Paul, is engaged in masonry contracting. The Northwest Flooring Company is engaged in cement and masonry contracting.

The city advertised for bids on certain cement and concrete sidewalk work. In this case, the amount of the sidewalk contract awarded to the lowest responsible

TY-ROCK SCREENS



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The balanced circle-throw action of the Ty-Rock plus the full-floating action on large shear type resilient rubbers enables this screen to separate material with unequalled speed and effectiveness.

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Manufacturers of Woven Wire Screens and Screening Machinery

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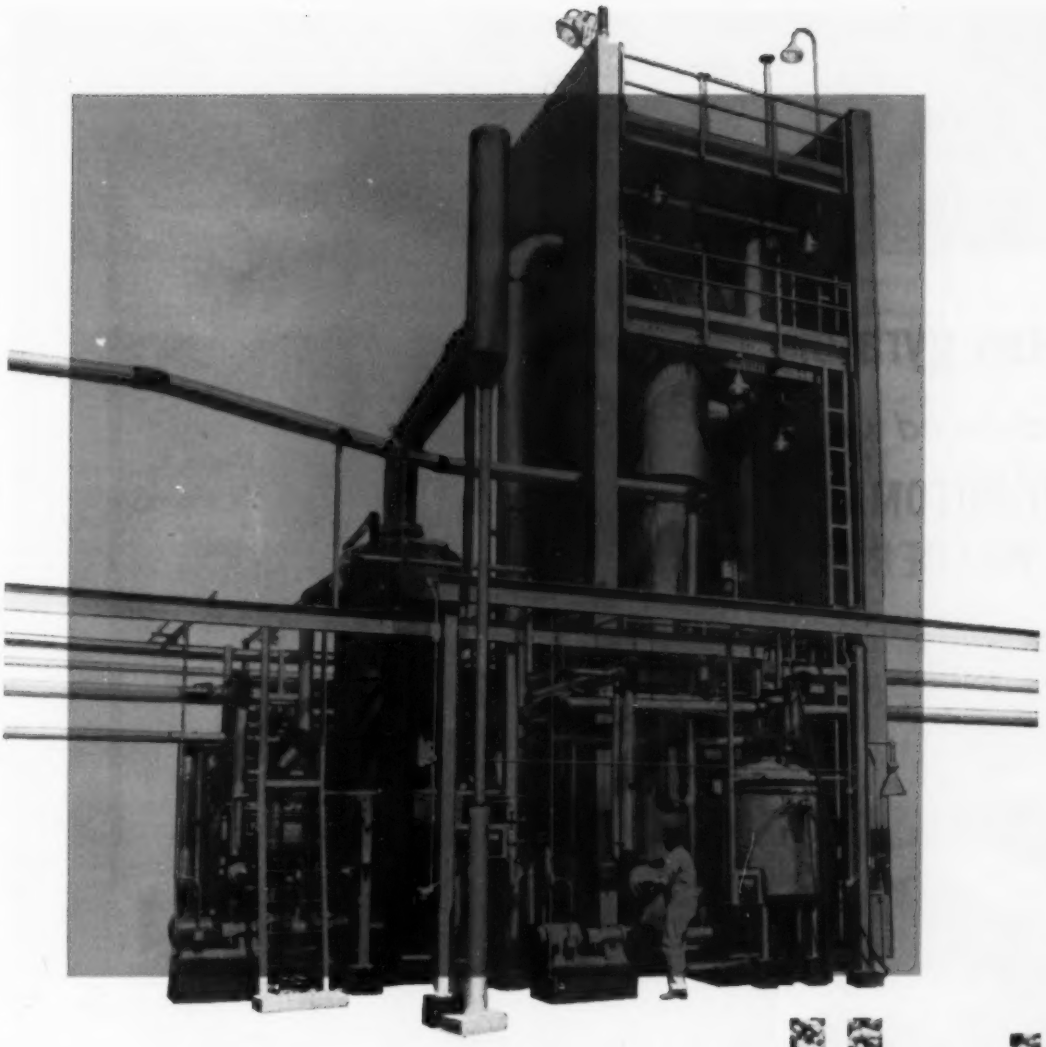

Now Ammonium Nitrate in pellets

New $5,000,000 Atlas Plant
Produces Unique, Improved Blasting Agent

Atlas is now producing low cost Ammonium Nitrate in a new pelleted form designed especially for blasting. Atlas Pellets give oil absorption equal to prills, and flow freely for fast loading into all types of blast holes. The new blasting agent is being made in the new $5 million Atlas acid and ammonium nitrate plant near Joplin, Mo.

Not a granule, not a prill, Atlas Pellets are porous but compact particles which, when oiled, have both the density and sensitivity required for efficient low cost ammonium nitrate blasting. They are the latest advance in developing new products and techniques to help the user of explosives gain lowest possible blasting costs. Your Atlas representative can help you put these products and techniques to profitable use in your operation.

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STOODY SEMI-AUTOMATIC WIRES *are available in a wide range of alloys for application through most standard semi-automatic welding machines.*

This gyratory is used in the reduction of copper ore, a tough operation that results in severe metal loss. In rebuilding the mantle, manganese bars were first welded in place with Stoody Manganese; the entire wearing area was then overlaid with Stoody 100 applied with the semi-automatic welder. 1800 pounds of weld metal were required for the job. The combination of Stoody alloys and the semi-automatic welder measurably increases service life and reduces maintenance costs on equipment subject to destructive wear. Your Stoody dealer (check the Yellow Pages of your phone book) has detailed information and will gladly demonstrate in your own shop.

STOODY COMPANY

11940 East Slauson Avenue • Whittier, California

bidder (Northwest Flooring Company) was $78,644. This bid was virtually $2,000 less than the next low bid.

Nielsen filed suit to invalidate the contract held by the Northwest Flooring Company on several grounds of irregularities, as follows: The bid was not opened by city officials until several minutes after 2 P.M., the time designated by the city's charter; the bids were not opened in the presence of the required officials; the bid was not presented by the Northwest Flooring Company in a sealed envelope; and the bond required to be submitted by bidders was not notarized.

It is interesting to note that the higher court held the contract between the city and the Northwest Flooring Company valid notwithstanding these objections and irregularities. The court said:

"The statute is intended to secure to the city the contracting of the work to the lowest responsible bidder, and mere irregularities in the form of the bid, or details of statement, which do not in any way mislead or injure, are not sufficient to justify the rejection of such a bid. In the present case there is no claim that there was any collusion or fraud between the bidder and the city or those advertising for bids."

5% Franchise Tax is Valid

A few weeks ago an official of a sand and gravel corporation asked advice as to whether the corporation can be compelled legally to pay to a state a franchise tax based upon its net income, where a considerable part of its business involves transactions outside the state.

Only a few weeks ago a higher court rendered an unusually important decision answering this question in the affirmative. Also, this court held that although the state taxation does not agree with the taxes collected by the Federal internal revenue department, this is not important.

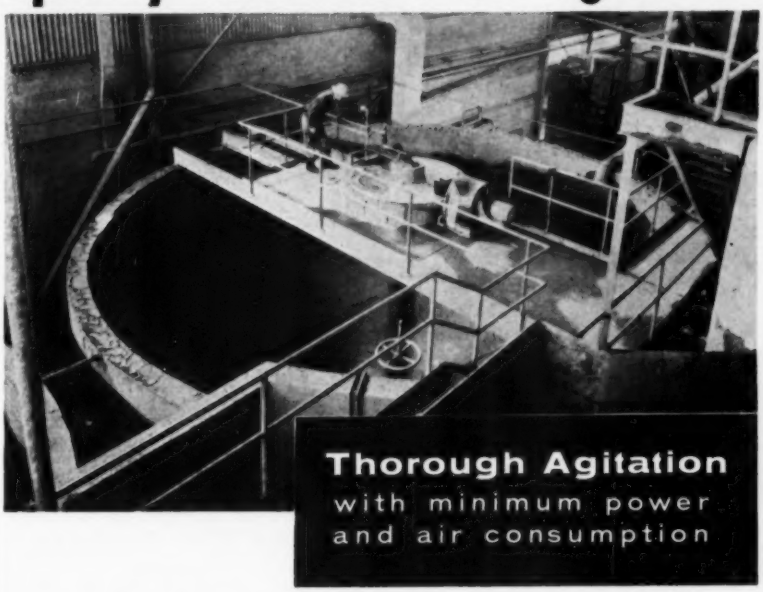
For illustration, in *Smoot Sand and Gravel Corporation* v. *District of Columbia,* 261 Fed. Rep. (2d) 759, the testimony showed facts, as possible:

The Smoot Sand and Gravel Corporation is engaged in the business of selling sand and gravel in the District of Columbia. It removes, washes, and grades sand and gravel along the shores of the Potomac River and its tributaries in Maryland and Virginia, and it transports the processed material in scows by tugboat to three "plants" in the District of Columbia, where the products are stored and sold.

During the past years approximately 95 percent of the sand and gravel was disposed of in the District of Columbia through sales effected at the three District plants, and the remaining 5 percent was sold in Alexandria, Virginia. A statute of the District of Columbia imposes a franchise 5 percent tax on the net income of every corporation derived from sources within the district. In view of this statute the tax assessor for the district assessed taxes on approximately 95 percent of the Smoot Sand and Gravel Corporation's net income.

In subsequent litigation, the counsel for the Smoot Sand and Gravel Corporation argued that a 5 percent

Specify MANITOWOC Agitators



Look at the Manitowoc Agitator above, installed in a clay slurry tank 30 ft. in diameter and 25 ft. high. This is but one of dozens of Manitowoc Agitators found in the foremost cement producing plants, both in this country and overseas. These quality conscious operators depend on Manitowoc for complete, uniform and economical slurry agitation . . . *plus* design which permits the installation of agitators in tanks up to 100 ft. in diameter, or larger.

By combining mechanical and air agitation, Manitowoc Agitators maintain consistently uniform particle size and chemical analysis in any type of slurry *without* a continuous application of air. As a result, compressed air consumption and operating costs are substantially reduced. Combine this cost-saving feature with the exclusive Manitowoc Control Valve, scientific air pipe design with an improved check valve, and rugged, channel construction agitator arms and you have the finest slurry agitator for turning out highest quality cement at *your* plant. Write now for detailed, helpful information.

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MANITOWOC, WISCONSIN

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tax should not be assessed against 95 percent of its net income because a considerable part of its net income was derived from business conducted outside the District of Columbia. It argued further that the Federal tax on its income is considerably less than that assessed by the tax assessor and commissioners for the District of Columbia.

The higher court disregarded these arguments and, in holding the assessments valid, said:

"The district statute levies a franchise tax for the privilege of doing business in the district, and the criteria which are to be taken into account for the taxing of such a privilege are not necessarily the same as, or even similar to those for a Federal tax on income. The statute involved in this case imposes, for the privilege of carrying on or engaging in any trade or business within the district, a franchise tax at the rate of 5 percent upon the net income of every corporation which is derived from sources within the district. The statute does not direct the Commissioners to give weight to any particular factors in prescribing a formula to determine the portion of net income which is fairly attributable to the business carried on within the District."

Seller of Concrete Wins Suit on Technicalities

Very frequently the seller of nonmetallic materials may win a favorable verdict on mere technicalities. This situation arose in a higher court litigation decided only a few weeks ago.

In *Bay Construction Company* v. *Southern Materials Company,* 261 Fed. Rep. (2d) 197, the testimony showed these facts:

On November 26 the Bay Construction Company, a general contractor, entered into a contract with the United States to construct a towing tank for a high-speed hydrodynamic facility. Before entering into the contract Bay Construction Company obtained from the Southern Materials Company a statement showing the prices at which the latter would furnish ready-mixed concrete for the project. Thereafter the Southern Materials Company agreed to purchase at the quoted prices, all the ready-mixed concrete needed for the project.

At that time, the Southern Materials Company had no knowledge of the existence of any subcontractor for the concrete work. After the first three days the Southern Materials Company was told that the Bay Construction Company had subcontracted the concrete work to the Seaboard Company and requested that all bills for concrete be directed to the latter company. Pursuant to the Bay Construction Company's request, the Southern Materials Company rendered all bills to the Seaboard Company including the concrete furnished during the first three days. Later the Southern Materials Company advised the Bay Company that no part of its bill for the concrete delivered on the job had been paid by the Seaboard Company and that it would have to notify the bonding company, which had furnished the Bay Company's bond. Then an official of the Bay Company urgently requested the Southern Company not to give such notice, informed the Southern Company that it would complete the

Our Plant No. 2 alone, has turned out in excess of 300 tons per hour

— says Dave Rogers, Daley Corporation, San Diego, California

More than 300 T.P.H. from one MADSEN Asphalt Plant – that's the kind of production that makes money! And, when you line up two big MADSEN Plants together, as the Daley Corporation has, you're in the bituminous mixing business in a big way.

Here's what Dave Rogers says about their MADSEN Plants – "Our two big MADSEN Plants running simultaneously can produce all the tonnage we need. Generally, we keep our 8000-lb. plant rolling steadily turning out batches for our own contracts – highways, airports, etc. That leaves our 6000-lb. plant free to handle our 'grocery store' business. This 6000-lb. plant is equipped with MADSEN's 'Auto-Cycling' system with fast and automatic operation of mixing, asphalt injection, dumping to truck and closing of mixer gate automatically. Mix specifications can be changed a dozen or more times a day if necessary with no loss of time.

"MADSEN's careful design, oversize construction throughout, with no 'weak spots' anywhere in the plant – together with the big-tonnage output, easy accessibility and low maintenance costs, plus excellent factory service . . . these are the advantages that sold us on MADSEN," says Mr. Rogers.

Whether you plan to buy 'em by the pair or are interested in a small, portable asphalt plant that can make you real money . . . you'll be ahead with a MADSEN Asphalt Plant. See your MADSEN Distributor today.

Features and specifications of the MADSEN Asphalt Plants shown:

PLANT MODELS AND CAPACITIES
Model 481 6000-lb. Batch Capacity
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GENEROUS AND OVERSIZE ANTI-FRICTION BEARINGS THROUGHOUT

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DRYER – Madsen Counter-Flow Dryers with Full-Floating Cast Steel tires and trunnions.

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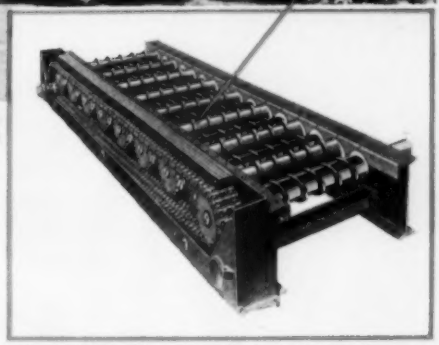
Mr. Joe Wenke, a 25 year veteran in the quarry business, operates a Portable Universal Wobbler Feeder-Impact Master Primary Plant combined with a portable Universal 800 Secondary Plant, in his quarry near Toledo, Iowa

"Our Universal plant handles wet material better than anything we've ever seen"

says Mr. Joe Wenke, veteran quarry operator from Toledo, Iowa



Elliptical-shaped bars form the feeder bed and are set in alternate vertical and horizontal positions. Turning of bars imparts a rocking, tumbling, forward motion to load. Fines drop through bar spacings to under conveyor and by-pass primary crusher.

"We're using Universal's Wobbler Feeder-Impact Master combination ahead of our portable secondary, a Universal 800. We're working in limestone and last year's heavy snows made the material really wet. But that didn't slow down production. Our Universal plant handled this material better than anything we've ever seen.

"Before we installed Universal we were having difficulty in this wet material. Our other impact crusher couldn't clean itself out. The material banked up, the rocks bridged and we had to shoot several times a day to clean it out.

"Universal's Impact Master cleans itself. The whole secret is that the rock goes straight out. We've been able to reduce welding time on the hammers from three hours a night to only four hours a week. We've increased our production, too. The Wobbler Feeder sifts out all 2½" and under material ahead of the crusher. The crusher works only on oversize."

Performance like this comes only from Universal's exclusive design principle: *Controlled impact action*. Raw quarry feed is reduced by impact blows from hammers on two rotors turning in the same direction as the moving material. Rock enters a congestion-free breaking chamber and moves out by straight-line action for fastest possible discharge. Impact blows from the first hammer shatter rock along natural cleavage lines eliminating any basic weakness in the raw material. Subsequent cross-breaking — by hammer impact — produces a highly cubical product. Finished sizes are controlled by speed of rotor hammers and simple adjustments of a stripper bar and lower screen grate.

We'll be glad to tell you what the Wobbler Feeder-Impact Master combination can do for you. Tell us the kind of material to be handled, the percentage of fines to be removed and desired capacity in tons per hour. We'll furnish complete information at no obligation. Write today.

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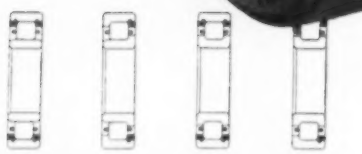

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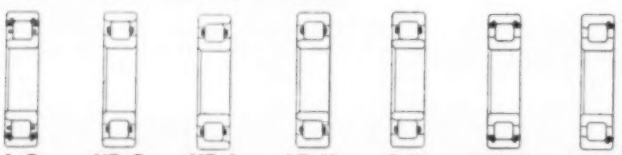

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contract work, and requested that the Southern Company continue to deliver concrete to the Bay Company on the job. The Bay Company, through its president, verbally agreed to pay the Southern Company for the concrete previously delivered to the job site and billed to the Seaboard Company.

In view of these facts the Southern Company relinquished its right to give written notice to the parties under the Miller Act which provides that sellers of materials who have not been paid must, within 90 days, send written notice to the bonding company and also to the general contractor.

Later the Seaboard Company went into bankruptcy and the Southern Company sued the Bay Company and the bonding company to recover $10,649.06, the amount due on the concrete furnished the Seaboard Company. Legal counsel for the Bay Company and bonding Company argued that the latter were relieved of any and all obligations to pay this amount due the Southern Company because the latter had failed to give the above mentioned notice to the bonding company and to the Bay Company.

The court held that the Southern Company was automatically relieved from giving this notice because the president of the Bay Company had promised to pay the Southern Company if the Bay Company would not send the notice to the bonding company. Hence, the court held that the Bay Company must pay $10,649.06 to the Southern Company. With respect to failure of the Southern Company to give notice to the Bay Company, the court held that this negligence was of no consequence, and said:

"Any person, such as a materialman, having direct contractual relationship with a subcontractor and also contractual relationship with the contractor furnishing said payment bond (prime contractor), has the right to sue upon the payment bond without being required to give written notice to the prime contractor within the ninety-day period mentioned in the statute."

With respect to failure of the Southern Company to give notice to the bonding company, the court held that this was not legally necessary because the Bay Company had promised to pay the Southern Company for the concrete delivered to the defaulting subcontractor, the Seaboard Company. Hence, the Bay Company was obligated under this new obligation to pay $10,649.06 owed by the Seaboard Company.

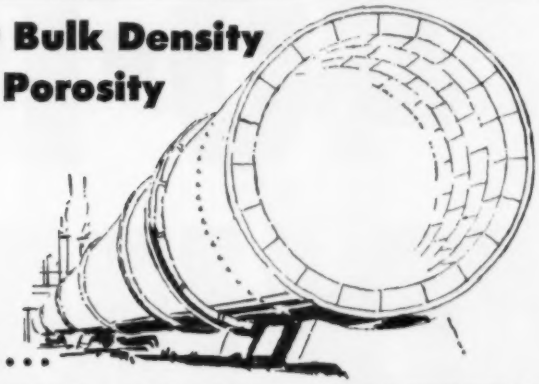
E. F. J. Clark has been appointed manager of the Toronto sales office of the Canada Cement Company Limited.

Ideal Establishes Fellowship For Graduate Civil Engineers

An annual $2,500 graduate fellowship has been established by the Ideal Cement Company of Tijeras, N. M., for a University of New Mexico student in civil engineering. The fellowship requires that the recipient spend full time in graduate study and do research on the use or application of portland cement.

Harry W. Montgomery, a recent U.N.M. graduate, is the first winner of the fellowship.

For Higher Bulk Density . . . Lower Porosity



Specify....

WALSH HIGH ALUMINA REFRACTORIES

Higher bulk density and lower porosity are plus values in Walsh Hi-Lumite Refractories for the lime and cement industry. They result in increased strength, greater resistance to abrasion and improved non-spalling characteristics for better performance and longer service life at elevated temperatures. Carefully graded and selected minerals, noted for non-shrinking qualities, are further enhanced by dry press manufacture, imparting uniformity of size and shape. For the whole money-saving story contact your nearest Walsh representative or write us for details.

WALSH HI-LUMITE 60 & 70
(60% & 70% alumina content, respectively)—For high temperature and calcining zones in rotary cement and lime kiln linings.

WALSH WARCO XXD FIRE BRICK
(high heat duty . . . dry press process)—For cold and hot zone rotary cement kiln linings and lime kiln linings.

WALSH MULLITEX D FIRE BRICK
(super duty...dry press process)—For intermediate and transition zone liners in cement kilns, burning zones of some lime kilns.

WALSH REFRACTORIES CORPORATION
101 Ferry Street • St. Louis 7, Missouri
Specialists in Refractories of High Bulk Density and Low Porosity
Enter 159 on card, page 177

Giant capacity with typical Mack performance advantages

NEW MACK 40-TON DUMPER

Mack's new LYSW Model is engineered and built to handle 40-ton loads of ore and rock with greatest performance and at lowest cost. Whether in strip mine or quarry service, this rugged addition to the Mack line brings traditional Mack performance to the most formidable hauling jobs. Operators net more tons per dollar because no other truck can match Mack's long operating prime of life under the most demanding conditions.

Powered by a 450 hp Cummins diesel engine, this 4-wheel-drive, 6-wheel end-dumper, with its 8-speed overgear transmission, air assist clutch, or optional torque-converter drive, has the ability to easily haul the biggest loads and at the same time provide unequalled handling ease and safety.

Mack quality shows up on the LYSW wherever you look. Axles and axle housings made by Mack are unmatched for sheer strength and durability. Mack-built transmissions are noted for dependable performance and long life because of their drop-forged, case-hardened gears and oversized shafts and bearings. Even the cab, with its heavy-duty all-steel welded construction bears the unmistakable stamp of Mack quality – as does the exclusive design of the driver's seat, unquestionably the finest offered for the man behind the wheel.

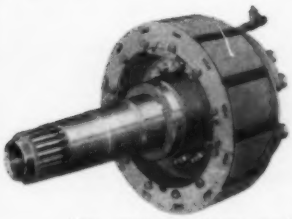
Let your Mack branch or distributor explain the many new and unique advantages of the LYSW Model. When you get the facts, you'll be convinced that an investment in a Mack makes sense from the start. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ont.

7140

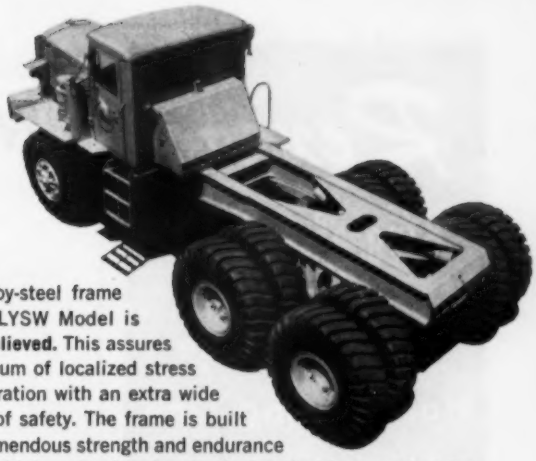
MACK
FIRST NAME FOR
TRUCKS

In grueling, long experience on the Mesabi Range, the new LYSW 40-tonner has responded easily to every demand made upon it... **SO MUCH SO, THAT THE DEMAND BY THE INDUSTRY FOR THE MACK LYSW HAS EXCEEDED ALL FORECASTS.**

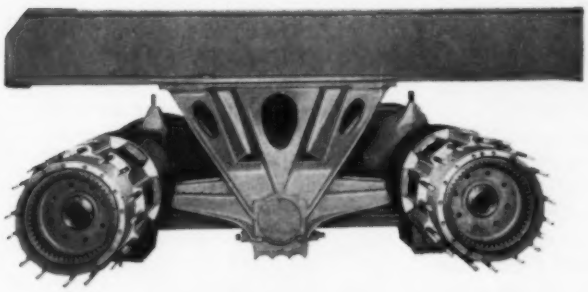
Enter 160 on card, page 177



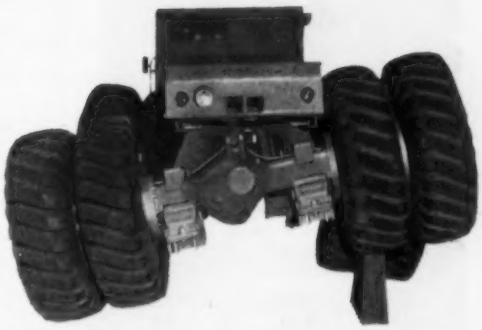
New radial-type maximum contact brakes are of latest air-over-hydraulic aircraft-type design. Positive braking control regardless of load is provided by use of 12 equally spaced blocks on each brake, activated by simple, positive, self-equalizing air-hydraulic system. The air-hydraulic rotochambers for each wheel are mounted inside frame for complete and safe protection. A set of internal expanding air brakes on the front wheels and a powerful hand brake working against the drive shaft complete the LYSW's braking system.



New alloy-steel frame on the LYSW Model is **stress relieved.** This assures a minimum of localized stress concentration with an extra wide margin of safety. The frame is built with tremendous strength and endurance factors which enable it to handle the heaviest loads and, at the same time, shrug off shock and vibration. I-beam side rails of heat-treated alloy steel have exceptional strength and stiffness (section modulus of 138), and the massive X-construction over the bogie ensures freedom from bending, wracking and twisting.



Newly designed Mack Balanced Bogie on the LYSW offers the strength and simplicity of straight-through drive and single-reduction carriers with Mack Planidrive reduction in the hubs. Exceptionally long tire life is achieved through unusual bogie flexibility which also reduces twisting and wracking of the frame. Even with diagonally opposite wheels raised more than a foot each, this flexibility keeps all wheels equally loaded and the frame level as shown. Mack's exclusive walking-beam suspension results in longer spring life by relieving springs of shock loads. And Mack's exclusive Power Divider directs power to the wheels having traction.



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"King of the Arc"
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The Complete
Hard Facing Line
MANUAL and
AUTOMATIC
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Write for
Free Brochures
The Sight Feed
GENERATOR COMPANY
WEST ALEXANDRIA, OHIO, U.S.A.

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FOR DEPENDABILITY
PLUS ECONOMY
REPLACE WITH
INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on
INDIAN BRAND
MANGANESE STEEL

Shovel Dippers • Dipper Teeth
Shovel Treads
Crusher Jaw Plates
Mantles • Concaves
Bowl Liners • Roll Shells
Pulverizer Hammers
Grate Bars • Breaker Plates
Ball Mill Liners • Screen Plates
Misc. Manganese Steel Castings

THE FROG, SWITCH AND
MANUFACTURING COMPANY
Carlisle, Pennsylvania • Established 1881

Enter 162-B on card, page 177

Manufacturers' News

What the manufacturer believes to be the first broad based program for leasing of custom engineered closed circuit television systems anywhere in the United States and Canada has been developed by Diamond Electronics Division of Diamond Power Specialty Corporation, Lancaster, Ohio.

Management of lease contract arrangements will be done in cooperation with American Industrial Leasing Company of New York City, according to D. J. Tricebock, division general manager. However, all preliminary arrangements will be made through Diamond Electronics sales engineers and sales representatives.

Lease contracts may include all standard equipment, standard and specialized accessories as desired, calebs, spares, applicable purchase taxes, and shipping and installation charges. Insurance on the installed system is also available at very nominal cost during the lease base period. Many different lease arrangements are available with base periods ranging from one to six years, and with various options for continuation of use after expiration of the base period.

The White Motor Company, Cleveland, Ohio, has announced that White and Autocar branches and distributors throughout the United States and Canada now are authorized and equipped to perform complete initial inspection and warranty work, as well as other service and maintenance, on Cummins diesel engines used in White and Autocar trucks and tractors.

White reports that warranty claims on all diesel engines in White and Autocar trucks and tractors, henceforth, will be handled directly through the White factory Warranty Division, as with other warranty claims covering White and Autocar vehicles, when initial inspection and warranty work are done by White branches or distributors.

CARL R. ROLF has been named president of Pioneer Engineering, Division of Poor & Company, Inc., Minneapolis, Minn. He succeeds OSCAR J. ELLERTSON who resigned as president to devote his full time to newly assigned duties as vice-president of Poor & Company, with headquarters in Chicago.

With Pioneer, Mr. Rolf has served as district manager of midwestern states, assistant sales manager, vice-president in charge of sales, and executive vice-president.

Carl R. Rolf

D. K. Heiple

D. K. HEIPLE has been named manager of the newly formed sales development department at Le-Tourneau-Westinghouse Company, Peoria, Ill. Associated with the company for the last 17 years, he has served as the company's chief field engineer since 1948. In his new post, Mr. Heiple will continue to have charge of field engineering activities and in addition will be responsible for the company's marketing research and sales engineering programs.

B. L. WILLMORE, head of the sales economic section and assistant secretary of the Bemis Bro. Bag Co., St. Louis, has been named assistant to the vice-president in charge of procurement and materials, H. P. CLAUSSEN. Prior to assuming his duties in the Boston executive offices, Mr. Willmore will attend the fall session of the Advanced Management Program at Havard University Graduate School of Business Administration.

A new trademark has been adopted by Hyster Company, Portland, Oreg. The block "H" replaces the Atlas symbol which has been Hyster's trademark for 30 years.

Three appointments have been made within the newly organized International Division of Bucyrus-Erie Co., South Milwaukee, Wis. R. M. NORRIS, recently elected vice-president in charge of the Division, has named R. T. CRAIG as general sales manager, J. A. ROSSI as manager of commercial cranes and excavators sales, and W. F. HARCOURT-PALMER as manager of large machines sales.

Mr. Craig, general manager of export sales for the last 26 years, has been engaged in foreign trade for nearly 40 of his 42 years at B-E.

Mr. Rossi has been in export sales at B-E since December, 1946. After serving as a sales representative in Latin American countries, he was assigned to the home office at South Milwaukee in 1955 as a sales engineer and, more recently, has been in charge of distributor relations. Mr. Harcourt - Palmer joined the company in 1950 and has been responsible for B-E's Brazilian activities since 1952.

Two sales managers have been appointed by A. O. Smith Corporation, Permaglass Mechanized Storage, Harvestore Department, Kankakee, Ill.

ROSCOE R. HEARD will direct industrial sales activities in the New England, Middle Atlantic, and Southeastern territories. Mr. Heard has 22 years experience in the materials handling and related fields. He will headquarter in Easton, Pa.

CLIFFORD P. SELL, has been assigned the Great Lakes area and the central states from Canada to the Gulf. Mr. Sell has 11 years; experience in product development, sales engineering, and materials handling problems. He will operate out of Park Forest, Ill.

NEW SERIES 350 BANTAMS

...fastest producing all-around performers their size ever to work the pits!

The all-new BANTAM Series 350 introduces to pit operations the greatest combination of high-income essentials yet offered.

Think of it! BANTAM's famed low-cost, top-dependability advantages, now ready and waiting for you in this bigger-production series—carrier, crawler and self-propelled models. Capacity is greater! For the carrier model shown you can handle 11-ton loads . . . work with ⅜- or ½-yd. dragline bucket . . . heap up production with ⅜- or ½-yd. digging shovel buckets and ⅞-yd. rehandling dippers. You've never dug so fast in hard materials or loaded so rapidly out of stockpile before with any machine anywhere near BANTAM's popular, go-anywhere practical size!

BIG OPTION CHOICE REWARDS YOU MORE

With the job-proved new BANTAMS *you* get the choice of features you want in a modern, big-capacity crane-excavator! Select *exactly* what your jobs call for . . . only what your budget permits: gasoline, diesel, LP-gas power . . . torque converter . . . 2-speed transmission . . . house-type or all-vision cab . . . in-cab digging lock (crawler model) . . . plus lots more, all in addition to 11 different quick-change BANTAM-built attachments to extend your job income range.

ASK YOUR BANTAM DISTRIBUTOR FOR A BANTAM JOB-TRYOUT NOW!

BANTAM C-350
crawler model . . .
7-, 8-ton capacity

BANTAM CR-350
self-propelled model . . .
11-ton capacity

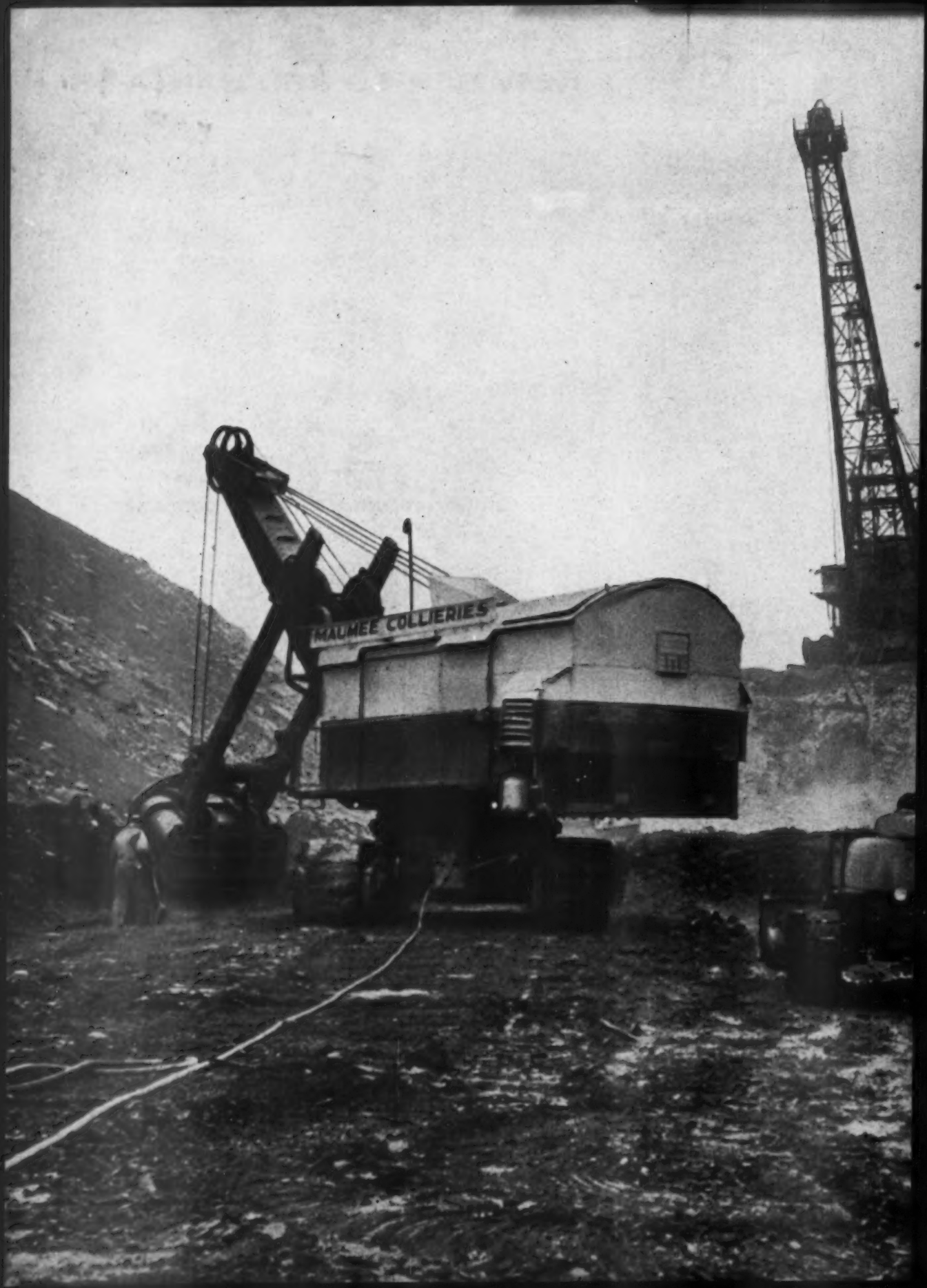
SCHIELD Bantam Co.

Schield Bantam Co. RP-229
219 Park Street, Waverly, Iowa
Please rush me information on the new BANTAM 350 Series:
- ☐ carrier mounted BANTAM,
- ☐ crawler mounted BANTAM
- ☐ self-propelled BANTAM.

Name.....
Title.....
Company.....
Address.....
City.....Zone....State.....

WORLD'S LARGEST PRODUCER OF TRUCK CRANE-EXCAVATORS

Enter 163 on card, page 177


MAUMEE COLLIERIES

At the Maumee Collieries in Indiana...

ANACONDA SHOVEL CABLE HAS A RECORD: 10 YEARS ON THE ROCK PILE!

Anaconda's SH-D Cable gives many years of dependable service in spite of heat, moisture, kinks, rocks and runovers!

How many shovel cable hazards can you count in this picture from the Maumee Collieries? Rocks . . . moisture . . . kinks . . . danger of runovers—they're all there. Yet the first installation of Anaconda's rugged SH-D Shovel Cable has resisted them all—*for 10 long years!*

It's proof again of the way Anaconda's in-the-field experience with Shovel Cable pays off in a superior cable for you. The important knowledge gained from use and testing of SH-D Cable *on the job* in our own mines goes into the design and manufacture of Anaconda Shovel Cable.

For example, the insulation is Anaconda Butyl (AB). Nothing can beat it for withstanding ozone, heat and moisture. Patented rubber cores cushion the ground wires and help prevent breaks from kinks and runovers. SH-D has a neoprene jacket that is exceptionally tough and abrasion-resistant. And every design, every component has been job-tested—your assurance of superior quality and performance.

Call on the Man from Anaconda with your cable problems. Or see your local Anaconda distributor. For new descriptive Bulletin DM-5818, "Anaconda Securityflex Portable Cables for the Mining Industry," write: Anaconda Wire & Cable Co., 25 Broadway, New York 4, New York.

50812

◀ For a decade, the Anaconda SH-D Shovel Cable you see here has been giving dependable service for the Maumee Collieries, Jasonville, Indiana. Its many superior design features enable it to resist on-the-job hazards that would knock out ordinary shovel cables.

ASK THE MAN FROM

ANACONDA®

FOR **SHOVEL CABLE**

Enter 164 on card, page 177

UNSTICK stuck BINS

with new electro-permanent magnetic

ERIEZ HI-VI VIBRATORS

PAT. PEND.

Here's the newest and most efficient answer to those hard-to-move materials in sticky bins . . . designed to provide superior operating efficiency . . . exclusive pinpointed vibration gets right to the trouble spot – starts stubborn materials moving!

NO RECTIFIER NEEDED • COMPLETELY ENCLOSED HOUSING • GREATER VIBRATION IMPACT THAN COMPARABLE SIZE UNITS • RUGGED AND DURABLE • LOW FIRST COST • LOW OPERATING AND MAINTENANCE COST.

Special Mill Mutual ACCEPTED Units for HAZARDOUS DUSTY LOCATIONS

GET THE WHOLE STORY . . . WRITE TODAY
Eriez Mfg. Co., 113-WB Magnet Dr., Erie, Pa.

ERIEZ

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Harnischfeger Corporation, Milwaukee, Wisconsin, has the following organizational changes in industrial relations and personnel administration:

ROBERT LOSSE, director of industrial relations and personnel now heads these activities in all Harnischfeger branch plants and sales offices, including the subsidiary Harnischfeger Homes, Inc., Port Washington, Wisconsin. Mr. Losse has been with the corporation 22 years.

JACK BOETTCHER, seven years with Harnischfeger, and formerly assistant to the vice president in charge of manufacturing, is now assistant director of industrial relations, in which capacity he will be directly concerned with labor contract, hourly wage and related administration.

Three divisional staff members have been appointed by Bagpak Division, International Paper Company, New York, N. Y. They will headquarter at the Camden, Ark., plant, reporting to C. B. MCCORD, manager of manufacturing also located at Camden.

A. S. MORGAN, a veteran of 26 years with the division, is now division production manager. A. R. DAVIS, who was plant engineer, is now division engineer. H. C. ROPER, the new divisional director of industrial relations, has been personnel director of the firm's Camden plant.

Production managers appointed for the company's multiwall bag operations are: E. R. FOGLE, Camden, Ark; J. A. HORNE, Mobile, Ala.; W. M. CATHEY, San Jose, Calif.; and A. C. KUEHN, Litchfield, Ill. All are veterans of more than 25 years' service with the company.

The appointment of R. DEANE BODDORFF as assistant manager, technical service sales, Explosives Department, Hercules Powder Company, Wilmington, Del., has been announced. Mr. Boddorff joined Hercules in 1939, and brings to his new position a background of experience in research, as well as in sales and technical service of industrial explosives.

Designed to PERFORM BEST in YOUR PARTICULAR APPLICATION

ERIEZ

non-electric

MAGNETIC PULLEYS

Now available with magnetic elements of lifetime-powered Alnico V or new Ceramic materials—to assure you the *most effective* installation for your particular application!

Only Eriez – with its years of know-how based on solving magnetic problems of all types for industry – offers such a wide range of PERMANENT MAGNETIC PULLEYS to meet your specific needs. Remove tramp iron or iron fines efficiently, economically, *automatically!* Size for size, Eriez Pulleys provide two to three times greater magnetic fields than limited radial center air gap units. Magnetic strength unaffected by heat or cold. No "weak spots" . . . magnetic strength extends across entire Pulley face. Standard sizes range from 4" diameter thru 30" diameter and in many belt widths.

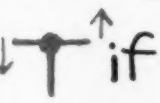
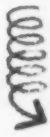
NO OPERATING OR MAINTENANCE COSTS • EFFECTIVE FOR WET OR DRY MATERIALS • EASILY, QUICKLY INSTALLED ON NEW OR EXISTING EQUIPMENT • PROVED IN THOUSANDS OF APPLICATIONS IN EVERY TYPE OF INDUSTRY

Be sure of getting the most effective unit for your exact needs. Contact us; we'll work closely with your engineers to provide peak performing magnetic equipment at the most economical cost to you.

WRITE TODAY FOR COMPLETE LITERATURE
Eriez Mfg. Co., 113-WA Magnet Drive, Erie, Pa.

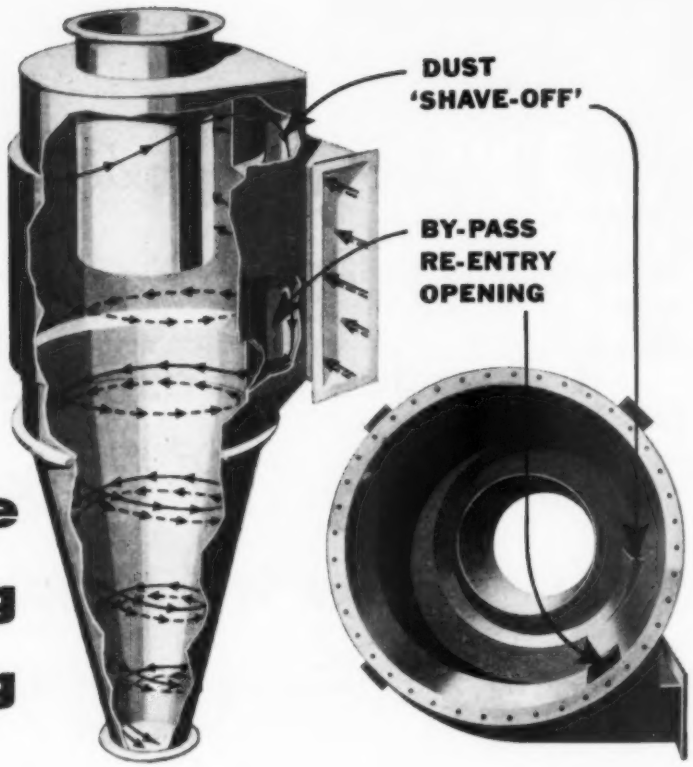
ERIEZ

Enter 166-B on card, page 177

If it rolls on an axle or turns in a bearing or rides on a shaft if it slides in a groove or moves on a pivot  if it bores  or cuts or transmits pressure one of Sinclair's 500 specialized lubricants is designed to make it work better. For answers to your lubrication problems, write today to

SINCLAIR REFINING COMPANY

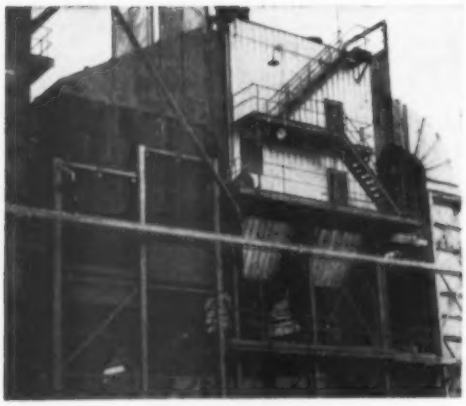
Technical Service Division
600 Fifth Ave, N.Y. 20 N.Y.



This Cyclone won't clog or plug

Buell's exclusive 'Shave-off' design permits large diameter cyclones that will not clog, plug, or bridge when properly operated: you avoid unnecessary maintenance work or process interruptions.

The unique Shave-off port traps the dust that whirls upward in double-eddy currents, increases cyclone efficiency by eliminating this source of dust reentrainment. Whether installed singly or in groups, Buell Cyclones are the most efficient ever developed.



Large-diameter Buell Cyclones in series with Buell 'SF' Electric Precipitator.

Other features include extra heavy plate construction for longer service life, Buell-designed manifolds for more efficient, non-turbulent flow of dust-laden gases . . . and the confidence assured by a history of hundreds of installations everywhere in America. Write for a copy of the 12-page booklet, "The Exclusive Buell Cyclone": Dept. 18-I, Buell Engineering Company, Inc., 123 William Street, New York 38, N. Y.

buell®

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

Southern Industrial Equipment Company, Miami, Fla., has been named franchise representative for the sales and service of Yale industrial lift trucks and tractor shovels of Yale Materials Handling Division, The Yale & Towne Manufacturing Company, Philadelphia, Pa. President of the new representative firm is ARTHUR N. JOLLIFFE, a veteran of more than 20 years; experience in the sales and service of Yale industrial equipment. The company's territory includes that portion of Florida south of and including the counties of Indian River, Okeechobee, Highlands, and Charlotte.

American Hoist & Derrick Company of St. Paul, Minnesota, has acquired the firm of Hetherington & Berner, pioneer Indianapolis manufacturers of stationary and portable asphalt plants and paving machinery.

The company reports that DONALD R. BERNER, vice-president of Hetherington & Berner, will be come general manager of the new wholly owned subsidiary and that both Indianapolis plants will continue to operate under the Hetherington & Berner name.

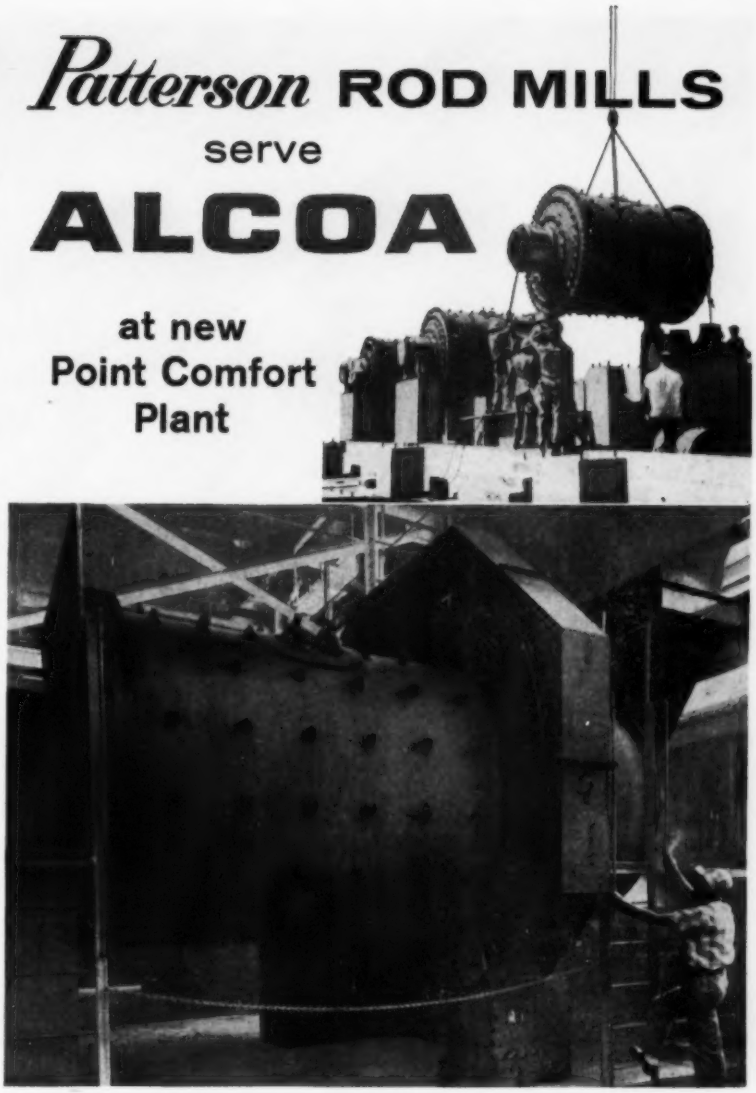
Three service training schools lasting two days each were recently attended by a total of ninety mechanics, operators, supervisors, and owners of Euclid equipment. The courses held in Miami, Orlando, and Jacksonville, Fla., were sponsored by the Square Deal Machinery Company of Orlando.

A factory instructor from Euclid's service department covered such subjects as preventive maintenance, troubleshooting, and rebuilding of the major components used on over-hung engine scraper models in the Euclid line.

Appointment of HUGH S. SELLS as manager of the Boston district and of ALBERT R. KNAUSS as Knoxville district manager has been announced by Allis-Chalmers Industries Group. Mr. Sells formerly was manager at Boston. Both men had been in their previous posts seven years.

(Continued on page 181)

Patterson ROD MILLS
serve
ALCOA
at new
Point Comfort
Plant



Six of these large Patterson Continuous Rod Mills are in service at Aluminum Company of America's new plant at Point Comfort, Texas. The 8′ x 10′ mills reduce bauxite from 6″ lumps to minus 10 mesh.

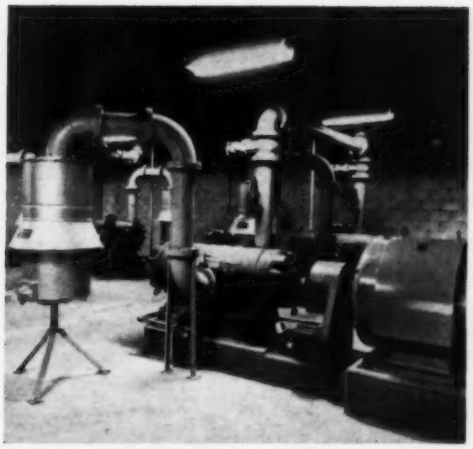
Mill shells are of one piece construction, furnished with heavy forged steel welding neck flanges for bolting shell section to the heads. Mill heads are of cast steel with integral cast main trunnion bearings. Replaceable linings of rolled steel have heat treated alloy lifter bars. Helical gearing is used with split gear construction for reversing gear and pinion for maximum life.

Patterson has designed a complete range of Ball, Tube and Rod Mills for continuous processing of a wide variety of materials ranging from alumina to zirconium. Our engineers will recommend a most economical process available for your needs, whether for a single mill or a complete plant. Write!

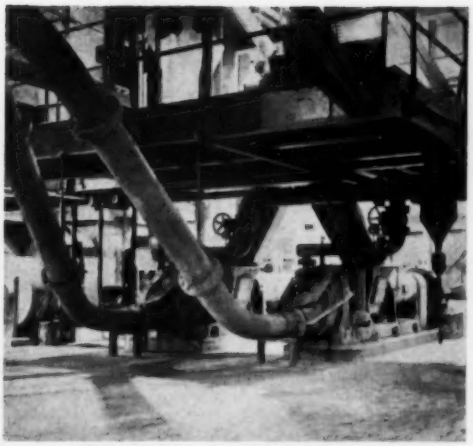
THE *Patterson* FOUNDRY AND MACHINE COMPANY
A Division of Ferro Corporation
East Liverpool, Ohio

Enter 169 on card, page 177

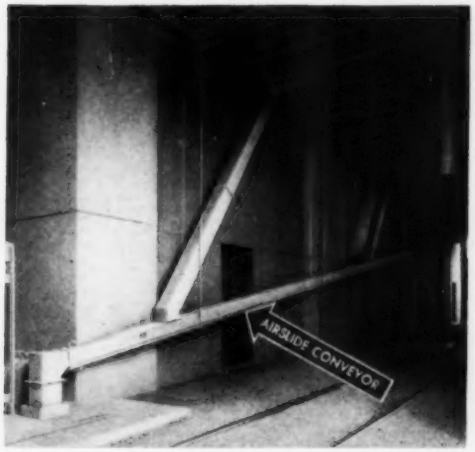
FULLER MATERIALS HANDLING EQUIPMENT HELPS CEMENT PLANT TRIPLE CAPACITY



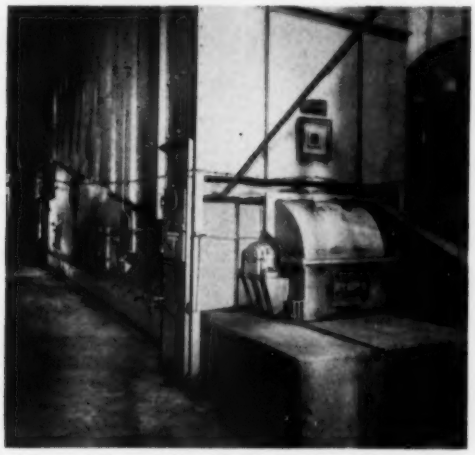
Group of C-300 single stage Fuller rotary compressors furnishing air for the Fuller-Kinyon pumps in raw-finish department.



Two 10" Fuller-Kinyon pumps in raw mill pumping material to blending silos.



F-H Airslide Conveyor under new finished cement silos feeding to Fuller-Kinyon pump for redistribution.



One of three Fuller Inclined Grate Coolers in kiln building.

Automation with a variety of Fuller equipment at Lehigh Portland Cement Company's Union Bridge, Maryland plant has helped triple capacity from 1,000,000 to 3,000,000 barrels a year.

In this installation, Fuller-Kinyon pumps handle both cement raw material and finished cement to and from process.

Fuller rotary compressors furnish air for both the Fuller-Kinyon pumps and general plant air.

Airslide® Fluidizing Conveyors are used at various stages of both the raw and finished mill operations in feeding both raw material and finished cement to and from process and storage.

Clinker is discharged from three 400′ kilns and cooled to about 145°F. by three Fuller 7′ x 44′ Inclined Grate Coolers.

This wide range of Fuller systems and equipment in the field of pneumatic handling makes it possible for Fuller to find the method of moving dry bulk granular materials best suited to your particular application. Why not write for complete details today? 1324 Q-198-T

FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY
100 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Birmingham • Chicago • Kansas City • Los Angeles • New York • San Francisco • Seattle

Fuller
....pioneers in harnessing AIR

JOB RECORDS PROVE

Firestones keep tire costs down!

Count on Firestones to reduce your hourly costs—no matter where you work 'em! Every Firestone is job-engineered to match the punishment of the toughest jobs. They're built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires! Exclusive Firestone S/F (Shock-Fortified) nylon or rayon bodies shrug off bruising shock and impact. Specially designed Firestone treads and sidewalls roll through conditions that often ruin ordinary tires. Call your Firestone Dealer or Store and ask about the full line of Firestone tubeless or tubed off-the-highway tires. He'll recommend the tires that are built for your job! And, remember, Firestone off-the-highway tires are backed with on-the-job service!

Rock Grip Excavator Wide Base

Rock Grip Excavator

When ordering new equipment always specify Firestone tires—available tubeless or tubed.

Firestone

BETTER RUBBER FROM START TO FINISH

Copyright 1959, The Firestone Tire & Rubber Company

The New 30-R

has what it takes—and is ready to prove it

Check the specs . . . check the performance . . . you'll find the new Bucyrus-Erie 30-R offers the same outstanding stamina, speed, and ease of operation that make the 40-R and 50-R the most popular blast hole drills in their classes — *by far.*

THE ADVANTAGES ARE ALL THERE — IN A NEW ECONOMY SIZE

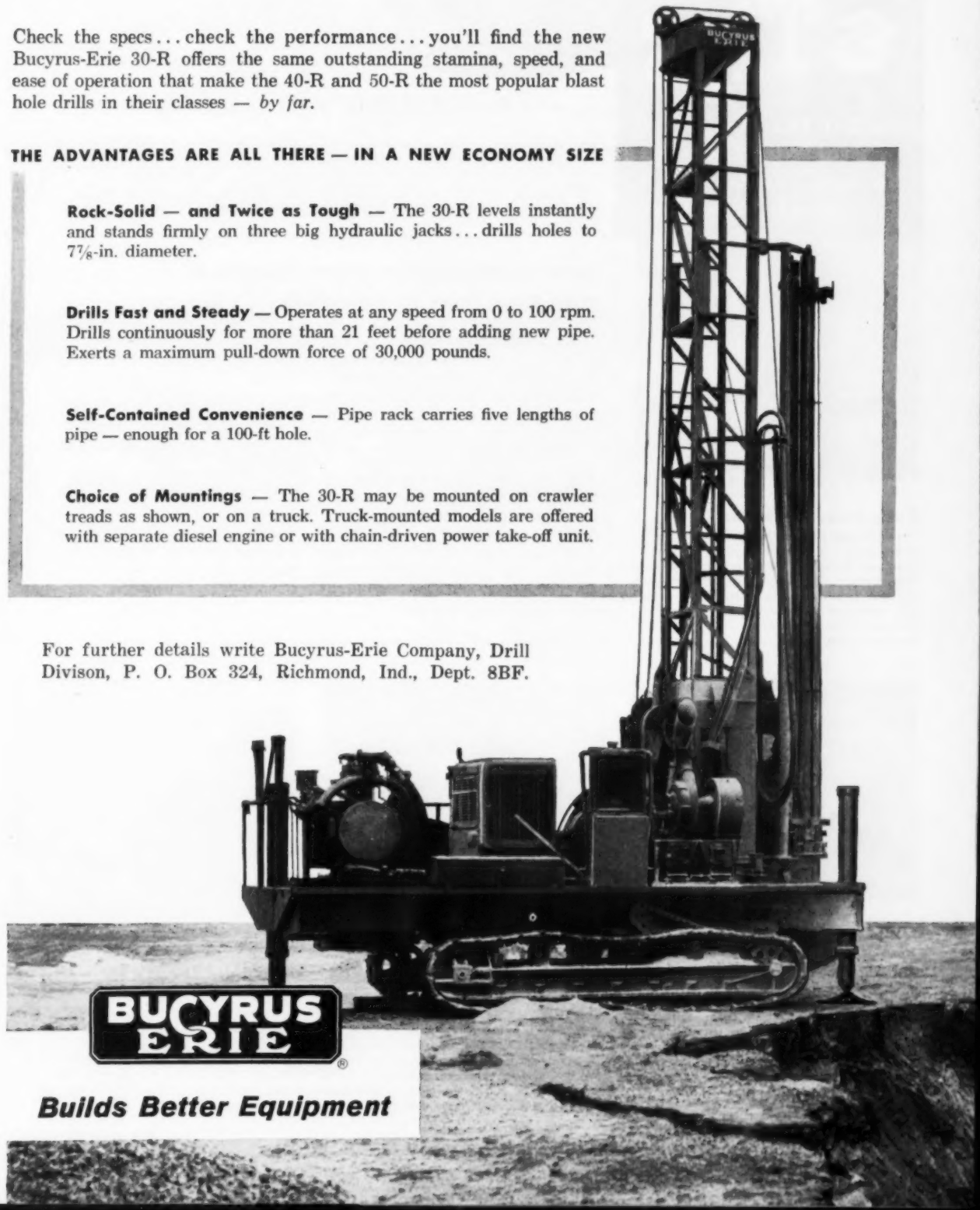
Rock-Solid — and Twice as Tough — The 30-R levels instantly and stands firmly on three big hydraulic jacks . . . drills holes to 7⅞-in. diameter.

Drills Fast and Steady — Operates at any speed from 0 to 100 rpm. Drills continuously for more than 21 feet before adding new pipe. Exerts a maximum pull-down force of 30,000 pounds.

Self-Contained Convenience — Pipe rack carries five lengths of pipe — enough for a 100-ft hole.

Choice of Mountings — The 30-R may be mounted on crawler treads as shown, or on a truck. Truck-mounted models are offered with separate diesel engine or with chain-driven power take-off unit.

For further details write Bucyrus-Erie Company, Drill Divison, P. O. Box 324, Richmond, Ind., Dept. 8BF.

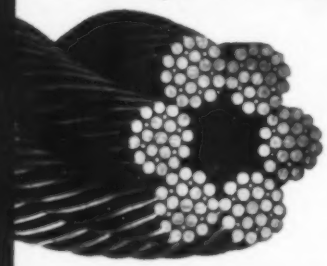


BUCYRUS ERIE®

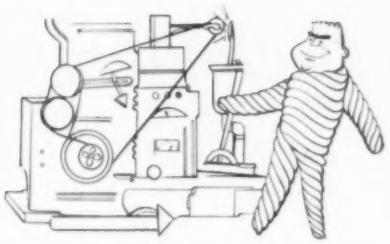
Builds Better Equipment

Tuffy® Wire Rope Tips

To Get The Most for What You Pay
Be Sure You Get Correct Rope Lay



Wire Rope is a "Machine" of Moving Parts



...and Every Part Must Fight Destructive Forces

A "look inside" a piece of wire rope reveals a precision-designed assembly of working parts. The parts are core, wire and strand. They are subjected not only to external and internal stresses and strains, but also to heavy surface pressures and abrasions. All these forces may be sustained while the rope is running under very high speeds, and abruptly changing direction of motion. That's why different uses require different constructions of wire rope.

Tuffy Balanced Dragline Rope

Here's highest abrasive resistance with super flexibility. Better spooling. Smoother riding on grooves. And Tuffy Dragline Rope hugs the drum when casting for full load. Gives you longer service life, consistent dependability, in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

Extra Strength Alone is Not Enough... Wire Rope Must Be BALANCED

Sometimes extra strength is heavily stressed in advertising wire rope. While strength is important wherever wire rope is used, it is not the only important property. And there are cases where too much strength is a liability.

For example, manufacturers of scrapers have designed their equipment to take certain loads. These loads are controlled by, or subject to the ultimate strength of the rope. Larger ropes with higher strength do not break, but *the equipment itself begins to break up.*

Depending on your use of wire rope, the "job prescribed" Tuffy Special Purpose Ropes give you the RIGHT BALANCE of strength, toughness, flexibility for greatest efficiency and longest service life.

Tuffy Balanced Slings & Hoist Lines

"Balanced" because they combine strength, flexibility and toughness in the proper relationship to do a better job longer.

Tuffy Slings and Hoist Lines are a top-performing team in every type of materials handling. The slings are made of a patented, machine-braided fabric that's next to impossible to knot or kink. The hoist lines are a special construction in which strength, flexibility and toughness are balanced.

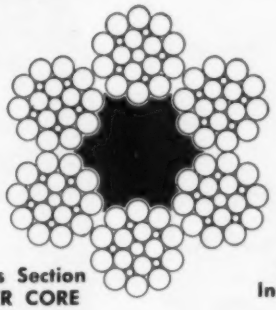
Tuffy Balanced Dozer Rope

Built to give you longer service with less downtime. Mounted on your dozer, a 150' reel of ½" or 9/16" can give you a big bonus of extra service. Here's how: when rope shows drum wear or is crushed on the drum, you feed through just enough to replace the damaged part. You save the 40 to 50 feet ordinarily thrown away. Also available in 300' and 500' reels.

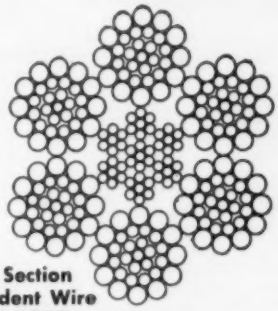
Tuffy Balanced Scraper Rope

"Balanced" construction makes it flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Also gives higher resistance to the shock of load impact on slack line. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.

Let's Take A Look at the CORE of Wire Rope



Cross Section
FIBER CORE

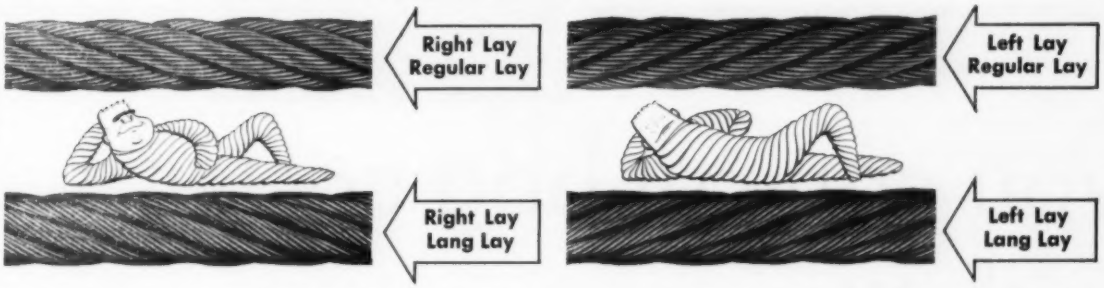


Cross Section
Independent Wire
ROPE CORE

It's either fiber or steel. Fiber cores are usually made from sisal, java, manila or combination of such hard fibers. Steel cores are either wire strand or an independent wire rope core, which amounts to a separate wire rope. The core serves as a base for the strands, keeping the rope in round shape and providing clearance between the strands for freedom of movement.

It's easy to see why wire rope is a "machine"—deserving the same care in selection and use that is given to any fine machine.

Which Lay of Wire Rope is Right for What Use



The "lay" of a rope is described in directional terms. It's a **right lay** when the strands pass from left to right across the rope. It's **left lay** when they pass from right to left.

Wire rope is also either **regular** or **lang** lay. In the **regular lay** the wires are laid in strands opposite in direction to the lay of the strands. In the **lang lay** rope, the wires are laid in the strands in the same direction as the lay of the strands.

Most wire rope is **regular lay**. It has the greatest stability under the widest range of uses. On the other hand, **lang lay** is used in applications where greater flexibility and longer wearing services are needed.

FREE!

Complete Splicing and Socketing Manual with engineer's notebook on wire rope constructions and specifications. Write for your copy now. Address Union Wire Rope Corporation, 2132 Manchester Ave., Kansas City 26, Missouri.

Specialists in high carbon wire, wire rope, braided wire fabric, stress-relieved wire and strand.

Good Man to Know: Your Nearby Union Wire Rope Distributor

Whether your wire rope need is a scheduled replacement or a red-hot emergency, your Union Wire Rope distributor is ready. He keeps varied stocks of Union standard constructions and the Tuffy Special Purpose Ropes. And he's backed by quick service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. If you don't know your Union Wire Rope distributor already, look under "Wire Ropes" or "Slings" in your telephone directory yellow pages.

Your Tuffy Distributor Can Help You Get Longest Service Life and Cut Rope Costs

UNION Wire Rope

New steels are born at Armco

ARMCO

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Southwest Steel Products

4

IF YOU PACKAGE **CEMENT**

you can cut bag costs with **WONDERWALL**™

For example, 9 cement companies show average savings of $2.75 per M bags by switching to the new, tougher WONDERWALL from their natural kraft bags.

Typical of these savings are those of one prominent cement firm that had used a 15½" x 3" x 27½" four-ply bag of 160# total paper basis weight. When they changed to a three-ply WONDERWALL of 130# total paper basis weight, they saved 30# in paper basis weight and cut their cost by $2.85 per M bags.

The comparable bag constructions were:

Old Natural Kraft Multiwall	
4/40	160# Total Paper Basis Weight
New WONDERWALL	
2/40, 1/50	130# Total Paper Basis Weight
Saving	30# Paper Basis Weight

Even though lighter, WONDERWALL resists breakage better because it's made with Kraftsman Clupak*, the extra-strong kraft with the built-in *stretch*.

See how WONDERWALL can cut *your* bag costs! Just write Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, N. Y.

*Clupak, Inc.'s trademark for extensible paper, manufactured under its authority.

West Virginia Pulp and Paper

more information, please

Use postcard to receive literature or details on new equipment and products reported in this issue.

2 IN 1 HAMMER TYPE ROCK CRUSHERS are detailed in Catalog No. 800, published by *Gruendler Crusher & Pulverizer Company*. Specifications, a dimension chart, and installation photos of the crushers are included. Built in all sizes to meet every requirement, these crushers can be used as a primary-secondary or pulverizer. **(301)**

A GAS SCRUBBER BULLETIN issued by *Peabody Engineering Corporation* features high efficiency, direct contact gas scrubbers for removal of particulate matter, including sub-micron dust and fumes, and absorption of gases and vapors. Capacities range from 100 to 250,000 c.f.m. Principles of the Peabody Multi-Jet impingement baffle close-contact stage and Peabody's agglomerating slot stage are described and illustrated. Descriptions of typical applications are supplemented by photographs and flow diagrams. **(302)**

PRODUCTS FOR INSTRUMENTATION AND CONTROL manufactured by *The Hays Corporation* are covered in an illustrated condensed catalog. Divided into 7 sections, the book lists Hays instruments according to the 5 major process variables (Section 2 through 6); receivers (Section 7); and describes the company's all-electric combustion control systems (Section 1). A complete description and specifications are given for each product listed. **(303)**

AN ARTICLE ON WELDING POWER SOURCES, reprinted from "Iron Age" and made available by *Air Reduction Sales Company,* offers a comprehensive guide to the proper selection of arc welders for use with the stick electrode, gas shielded tungsten-arc or gas-shielded metal-arc welding processes. Illustrated with 14 schematic drawings, the article details 8 specific steps to be taken into account when choosing one of the four basic types of power sources. **(304)**

INNERLOCKED ELEVATOR BELTING AND FASTENERS, manufactured by the *Imperial Belting Company,* are covered in a folder which includes an illustrated explanation of simple steps to better belting service. A chart to help in the selection of the exact size and quantity of fastener needed for perfect elevator belt joining is given. **(305)**

HYDRO-SCREEN WASHING PLANTS are described in literature just released by *Pioneer Engineering*. Illustrated is the Hydro-Screen principle of washing and screening aggregates. A drawing of the basic Hydro-Screen plant is supplemented by drawings of several models of the plant designed to meet specific aggregates washing problems. Specifications, photos, a cut-away of the Hydro-Screen, plus complete information on the entire Hydro-Screen plant line are presented in Bulletin No. 690. **(306)**

METER-MIST PACKAGED OIL SYSTEMS are illustrated and described in Bulletin 659, available from *Trabon Engineering Corporation*. The bulletin shows how a Meter-Mist installation works, protecting bearings and gears with proper lubrication. A table shows how to select Meter-Mist lubricator and reclassifier fittings. Information is included on the Meter-Mist flow indicator fitting which checks oil mist conditions at remote bearing locations. **(307)**

A BELT CONVEYOR BOOK published by *Link-Belt Company* contains detailed engineering and selection data on standardized Pre-Bilt sectional belt conveyors, available in four belt widths of 18-, 24-, 30-, and 36-in. Twenty-two components and accessories are listed in 40-page Book 2779. Illustrations show installation applications in a variety of industries and typical layouts. **(308)**

CEMENT MILL ELEVATORS are detailed in 8-page Catalog 981 from *Jeffrey Manufacturing Company*. Elevators feature 15 to 470 t.p.h. capacity range, dust-tight and weather proof casings, removable split head for easy access to head section, extra large doors, heavy duty anti-friction bearings, and renewable hardened steel sectional rim wheels. Heavy-duty steel knucklet chains and reinforced malleable iron buckets are also covered. Ample charts, dimensions, photos, and descriptive copy are presented. **(309)**

THE 500 SERIES CRAWLER CRANE-EXCAVATOR with a 40-ton crane capacity is detailed in a catalog released by *American Hoist & Derrick Company*. Described and illustrated are features of the 500 Series crawler, which can be operated with tracks extended for work or tracks retracted for loading. The unit

September ***PIT AND QUARRY*** **1959**

Insert key numbers found below items on advertising, literature, and new equipment pages. Print company name if not keyed.

VOID AFTER 60 DAYS

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Company_____

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We Produce_____

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more information, please

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easily converts to a crane-dragline-clamshell-shovel-backhoe-pile driver or for special grapple work. **(310)**

NEOTHANE CASTABLE POLYURETHANE RUBBER, a new development of the *Goodyear Tire & Rubber Company,* is detailed in an 8-page brochure. Neothane, in the pure gum form, is reported to be harder than most conventional rubber compounds and to have greater strength. Among the applications of Neothane forecast by Goodyear development engineers are bearings, belts, bushings, couplings, drives, gears, rotors, seals, supports, and industrial tires and wheels. **(311)**

"MEN, METHODS, AND MACHINERY", a 52-page brochure published by *Construction Aggregates Corporation,* describes several of the company's earthmoving, sand and gravel producing, dredging, sandfilling, stripping, and construction operations. Pictorial case histories show methods of operation and equipment used. In addition, the history of the Sensibar Sandfill Method is given. **(312)**

A REVISED RADIAMATIC CATALOG from *Minneapolis-Honeywell Regulator Company* offers a complete description of the theory and fundamentals of radiation pyrometry, as well as the function, construction, and application of Radiamatic pyrometers. A section on how to choose the proper radiation detector is also included Instruments that can be used with this type of temperature sensing element are detailed. **(313)**

A COMBUSTION SAFEGUARD BULLETIN published by *Protection Controls, Inc.,* describes the Protectofier combustion safeguard control for heating and heat-treating applications. These units provide continuous protection against fires or explosions from build-up of combustible fuel mixtures in either single or multi-burner installations. **(314)**

GENERAL PROPERTIES OF ROPES of du Pont nylon and Dacron are contained in Bulletin X-98, a technical publication offered by *E. I. du Pont de Nemours & Company, Inc.* Strength, elongation, shock absorbency, effect of ice and low temperatures, and splicing are some of the properties discussed. **(315)**

ARC WELDING MACHINES manufactured by *Hobart Brothers Company* are featured in a comprehensive catalog which includes complete specifications and ordering information. The catalog also describes a line of induction heating equipment, pipe thawing equipment, and a power source for cutting and gouging. **(316)**

THE WN-112 STATIONARY AIR COMPRESSOR, built for continuous, heavy-duty service for pressures to 125 p.s.i. with piston displacements from 468 to 974 c.f.m., is the topic of a bulletin issued by *Joy Manufacturing Company.* The booklet contains specifications, diagrams, cross section drawings, installation photographs, and other pertinent information. **(317)**

ROLLER CHAIN FLEXIBLE COUPLINGS are discussed in a revised bulletin offered by *Chain Belt Company.* Outlined are the advantages offered by a flexible coupling. The bulletin carries information on the proper selection of Rex flexible couplings and illustrates installation and maintenance procedures. **(318)**

JET PULVERIZERS for the dry pulverizing of material to micron-size powders are covered in an informative brochure prepared by the manufacturer, *The Jet Pulverizer Company.* Grinding, pulverizing, and processing actions are graphically described. The pulverizers are available in 8 sizes with mill diameters from 2 to 36 in. **(319)**

INSTRUMENTATION FOR KILN APPLICATIONS is outlined in a bulletin from *The Bristol Company.* Listed are pyrometers in controlling, recording, and indicating models; draft controllers and recorders; and thermocouple and radiation sensing units. References are given for more complete information on system components. **(320)**

TROYFELT, a synthetic, non-woven material available through *Troy Blanket Mills,* is the subject of a brochure which describes what Troyfelt is and how it is made, and details areas such as strength, dimensional stability, durability, and chemical resistance. Troyfelt is made of Dacron, Orlon, and other specialized synthetic fibers which are interlocked. Among the uses described is the application of Troyfelt as a filter removing taconite ore dust in a mining operation. **(321)**

FIRST CLASS
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CHICAGO, ILL.

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CHICAGO 5, ILL., U.S.A.

NEW SUBSCRIPTION ORDER FORM

Send PIT AND QUARRY to me for

____One Year $3* ____Two Years $5 ____Three Years $6

____Payment enclosed ____Bill me ____Bill company

Name_____Title_____

Company_____

Address_____

City_____Zone_____State_____

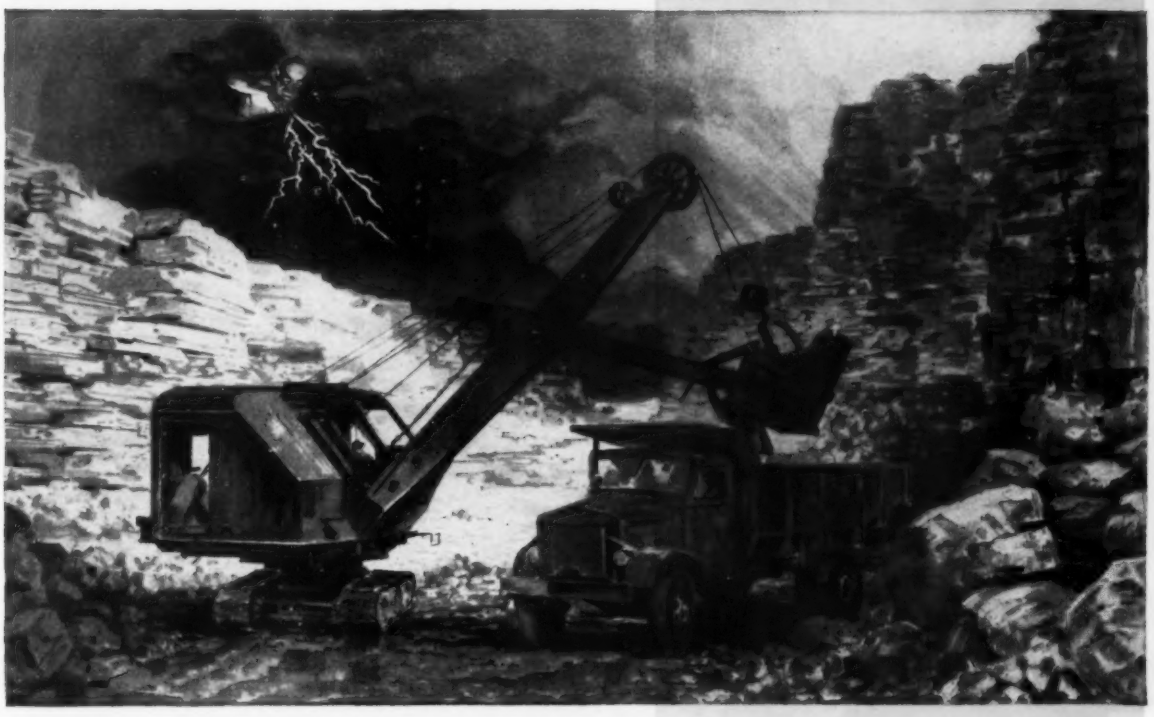
Type of business
and products _____

*U. S., U. S. Possessions, and Canada only.

Pan American countries, $10 a year; elsewhere, $15 a year.

A thunderstorm three miles away

has been known to detonate a blast prematurely

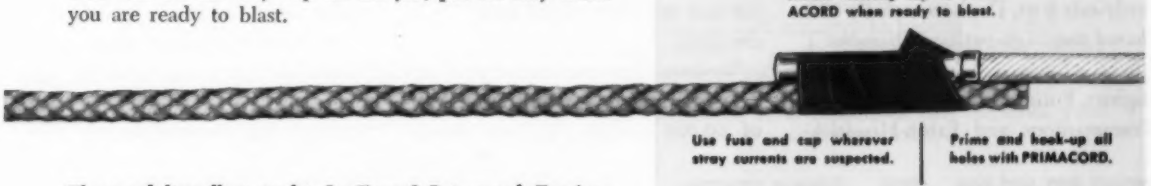


For best protection against stray electric currents

You need not worry about stray electrical currents when you can hook-up and detonate with Primacord! It acts as the detonating agent throughout the entire column of explosives, or furnishes initiation to primers. This use of Primacord will result in safer, easier, quicker loading. Primacord also connects all holes, providing positive initiation, with results that you should find profitable.

When your blast is loaded and hooked up, it cannot be set off by normal vibration or friction, ordinary impact or sparks, *or stray electrical currents.* Even a direct hit by lightning failed to detonate Primacord. It must be detonated with fuse and cap or electrical blasting cap. This will be the only cap on the job, put on only when you are ready to blast.

ENSIGN-BICKFORD PRIMACORD® DETONATING FUSE


Attach blasting cap to PRIMACORD when ready to blast.
Use fuse and cap wherever stray currents are suspected.
Prime and hook-up all holes with PRIMACORD.

The trunk line illustrated is Lo-Temp® Primacord. For further information see your explosives supplier or write to

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

Geared by FULLER...

Davison's rigs move more payload in less time

J. K. Davison & Bro., Pittsburgh, one of the largest ready-mix purveyors in western Pennsylvania, is supplying concrete for the Steel City's gigantic new civic-sports arena.

To increase the capacity of their ready-mix fleet, Davison recently purchased two high-payload Diamond T trucks with 8-yard mixers, 212 hp engines, Fuller Model 5-A-65 5-speed Transmissions and Eaton-Hendrickson Model 38DS Tandem Rear Axles.

Selected because of their proven reliability and ease of operation, the Fuller 5-A-65 Transmissions help provide the proper gear ratios for high maneuverability on congested job sites as well as added flexibility in city traffic.

Davison's new trucks feature four-axle construction, permitting GVW of 60,000 pounds. Because chassis weight has been held to 16,000 pounds, high payloads are possible . . . and because the Fuller 5-A-65 Transmissions permit the operator to select proper gearing for every situation, Davison is able to hustle more ready-mix to the job in less time.

There is a Fuller Transmission designed to put more profit in *your* operation. For details, contact your truck or equipment dealer.

FULLER

TRANSMISSION DIVISION
MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla. Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative

Manufacturers' News

(from page 169)

Jacob Press' Sons, Incorporated, Chicago, Ill., is celebrating 100 years in building commercial truck bodies. In 1859, Henerich Jacob Press I, a German immigrant, formed a partnership and produced some of Chicago's elegant carriages of the gaslight era.

In 1869, the firm became known as Jacob Press, employed 10 men, and operated in a 40- by 50-ft. building. In 1895, Jacob Press died, with control of the firm passing to his sons, becoming Jacob Press' Sons.

In 1921, the company constructed a new plant with 55,000 sq. ft. under one roof. Among the items being produced at this location today are: trailer dump bodies, dump bodies, stake bodies, sliding 5th wheels, and other types of bodies. The company is now run by the five sons of Jacob Press II, with Jacob H. Press III as president.

Bucyrus-Erie Company's $12,000,000 plant at Richmond, Ind., has been named one of the nation's top 10 plants which were all new and completed in 1958.

The Richmond facility, formally dedicated in June, 1958, was selected from more than 700 entries in the 25th annual "Top Plants" competition conducted by *Factory* magazine.

Bucyrus-Erie's complete line of rotary, cable tool, and portable drills is built at the new Richmond plant.

EDWARD STURM and WILLIS H. BRETT have announced the formation of Sturm & Brett Engineers, Inc., Chicago, Ill. The firm will specialize in design project work for the concrete, aggregate, and other industries.

St. Regis Paper Company has appointed Howard C. Peterson Jr., who has been associated with the company's Kraft Division, to the new sales post of corporate account executive. He will work with major accounts of St. Regis to further acquaint them with the diversified line of products offered by the various divisions of the Company.

When results are compared, Austin Apcomite proves to be more economical to use than on-the-job ammonium nitrate mixes. Besides producing greater explosive power per foot of loaded blast hole, it combines the low initial cost features of processed ammonium nitrates with the handling ease and controlled shooting of regular explosives.

Field tested for 3 years, Apcomite is ready for loading in vertical or horizontal holes—ready to shoot. Each tube has a primer in its nose . . . requires no special priming. Because it is always manufactured under the same uniform conditions, Apcomite can be used for controlled shooting not possible with on-the-job ammonium nitrate mixes.

2 TYPES MEET ALL CONDITIONS

Apcomite 17 and Apcomite 20A incorporate specially-processed ammonium nitrate packaged in 23G tubes of 5" and larger diameters. While they are basically the same, No. 17 is for all normal usage while No. 20A, with its greater density, is for wet holes.

Austin also produces Austinite 15, a controlled ammonium nitrate mixture furnished in polyethylene-lined burlap bags. Likewise available in bulk bags of 50, 80 and 100 lbs.

7 REASONS FOR USING APCOMITE

- low final cost provided by greater explosive power per foot of loaded blast hole
- convenience . . . eliminates most shipping, storage, mixing and materials handling problems
- no special priming needed . . . primer in nose
- packaged in 23G tubes that are easy to handle and load
- uniformly manufactured . . . no chance of improper mixing
- permits controlled shooting
- adaptable to vertical or horizontal holes

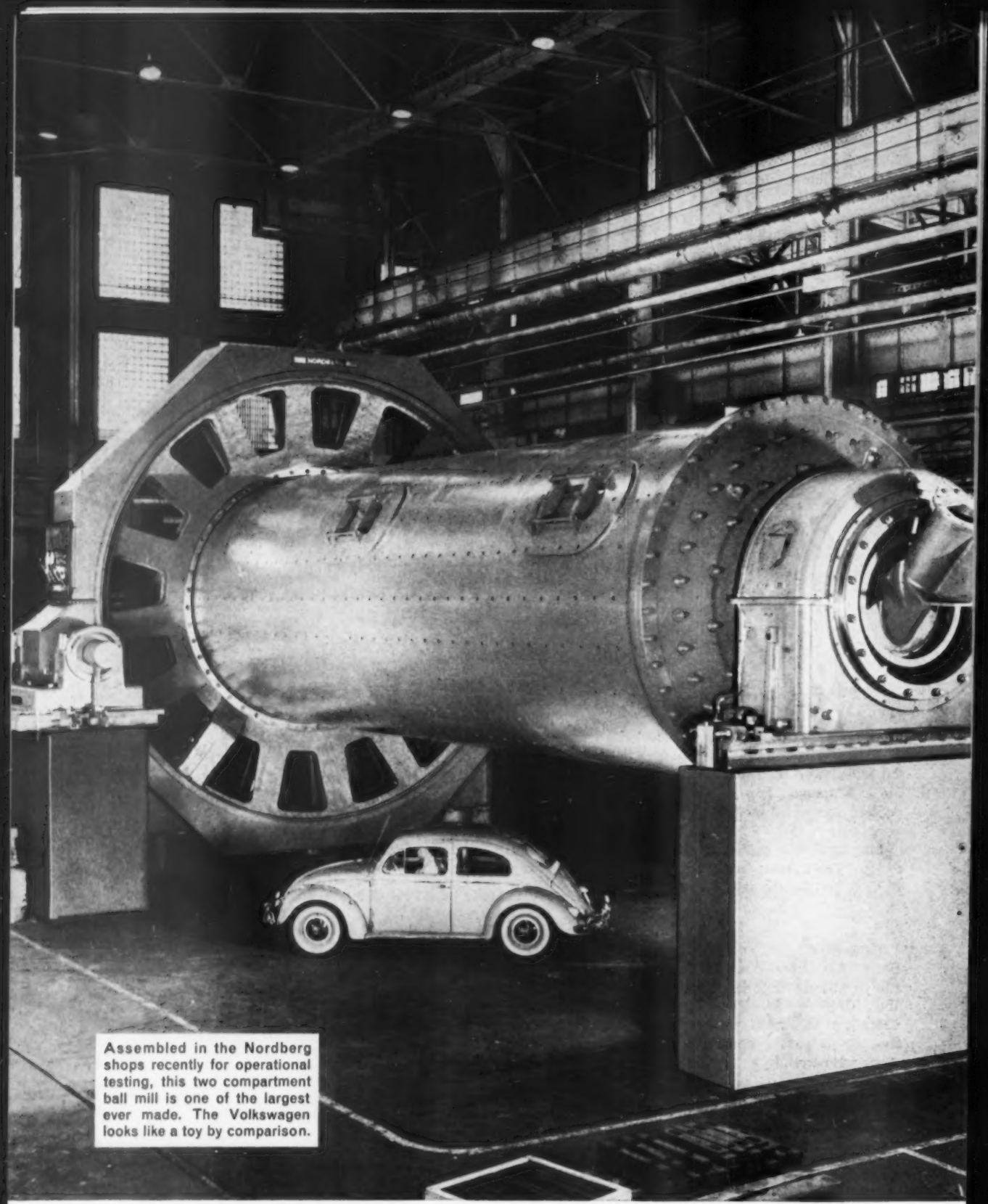
For complete details on how Apcomite can improve your operations, call your Austin representative today. A-401A

USED IN 1833 AUSTIN & EVER SINCE

AUSTIN
POWDER COMPANY
CLEVELAND 13, OHIO

explosives ◆ ammonium nitrates ◆ primers ◆ detonating fuse
permissibles ◆ blasting supplies ◆ AP drill heads and bits ◆ mine tools

Enter 181 on card, page 177



Assembled in the Nordberg shops recently for operational testing, this two compartment ball mill is one of the largest ever made. The Volkswagen looks like a toy by comparison.

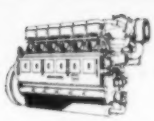
SYMONS PRIMARY GYRATORY CRUSHERS

SYMONS® CONE CRUSHERS

SYMONS VIBRATING SCREENS

SYMONS VIBRATING GRIZZLIES

ROTARY KILNS and COOLERS



NORDBERG ENGINES

Enter 182 on card, page 177

NORDBERG sets the pace in LARGE GRINDING MILLS

to turn out greater tonnages at lower cost per ton

Nordberg has recently completed five of the largest grinding mills ever built for industrial service. These two compartment Nordberg ball mills (see opposite page) are 12 feet in diameter by 36 feet long, each powered by a 2500 hp synchronous motor, operating at 10% beyond rating. These mills are being installed in a new 5 million barrel per year wet process cement plant. The economies of using very large grinding mills to turn out greater tonnages at lower cost are important, however, to many other large ore and mineral reduction processes, as well.

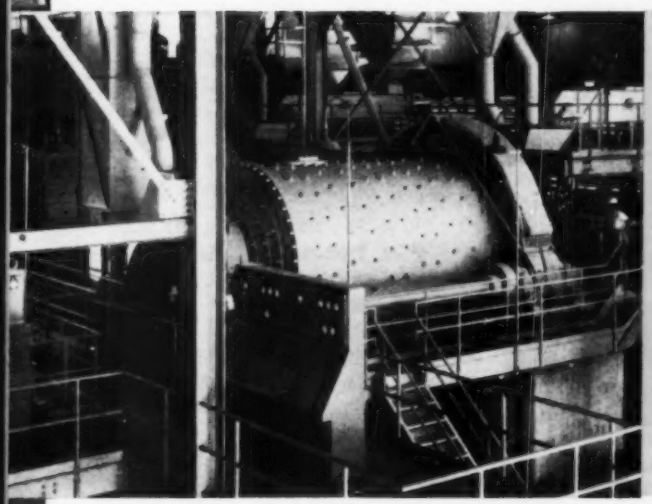
Consider some of these basic advantages:

1. *Lower construction and installation costs* . . . A single, large mill requires less floor space than several smaller ones, and only one foundation is required. Thus, construction costs are lowered and, in most cases, production is increased.

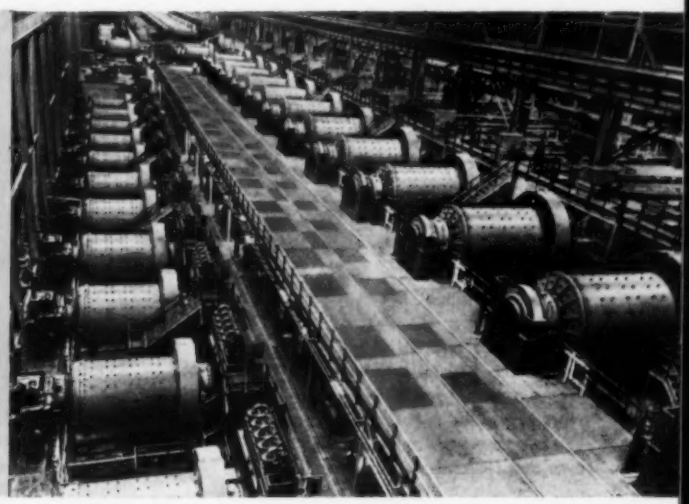
2. *Simpler automatic operation* . . . Where automatic operation is required, larger mills permit simpler handling with fewer controls. This lowers initial investment and minimizes installation and operational problems of automatic controls.

3. *Less maintenance* . . . Here, costs are again related directly to the number of mills installed. Fewer units mean less wearing parts and more dependable production. Exceptional savings may also be realized in replacement liners alone.

These are significant reasons behind the current trend toward larger grinding mills. But whether you require large or small grinding mills, you can count on the proven experience of Nordberg in furnishing the right grinding mill to meet your specific needs . . . including Rod, Ball, Pebble, Tube and Compartment types, in sizes from 6 to 13 feet in diameter and up to 50 feet in length. *Write for further information.*



Shown here are two of five 11′ x 17′ Nordberg Ball Mills—three raw and two finish—installed in a midwest cement plant that has a capacity of 3,000,000 bbl. annually.



The largest iron ore mill installation in the world with 58 Nordberg Grinding Mills. This concentrator building houses 27, 10′ x 14′ rod mills and 27, 10′ x 14′ ball mills. Four Nordberg mills serve as standby units.

NORDBERG MANUFACTURING COMPANY, Milwaukee 1, Wis.

©1958, N. M. CO. GM259

NORDBERG

SYMONS . . . a registered Nordberg trademark known throughout the world.

SYMONS SCREENS NORDBERG

ATLANTA · CLEVELAND · DALLAS · DULUTH · HOUSTON · KANSAS CITY · MINNEAPOLIS · NEW ORLEANS · NEW YORK · ST. LOUIS
SAN FRANCISCO · TAMPA · WASHINGTON · TORONTO · VANCOUVER · JOHANNESBURG · LONDON · MEXICO, D. F.

SHELDON Y. CARNES, regional manager, Multiwall Bag Division, West Virginia Pulp and Paper Company, New York, N. Y., has appointed SHELTON J. JONES to the position of staff assistant to ALLAN WOODRUFF, manager of the company's St. Louis, Mo., plant.

Appointment of S. J. BECKER as vice-president and chief engineer of the Spring Division of the Borg-Warner Corporation has been announced. Mr. Becker has been associated with the Spring Division, located in Bellwood, Ill., for 19 years. He joined the unit shortly after its founding in 1940.

CLAUDE HOWARD has been appointed electrical salesman for the Service and Supply Division of Lake Shore, Inc., Iron Mountain, Mich. He will represent Lake Shore in the entire Upper Peninsula of Michigan and bordering Wisconsin counties. He was previously in the steel division's sales department.

MORTON SUNDNES, engineer-in-charge of large stripping shovels and draglines at the Bucyrus-Erie Co., South Milwaukee, Wis., spoke at the annual meeting of the Open Pit Mining Association, June 18, held at the Missouri School of Mines in Rolla, Mo. Mr. Sundnes' subject was *The Application of T-1 Steel in Excavator Design.*

WILLIAM C. ROXBY has been promoted to manager of the Foreign Sales Division of Leeds & Northrup Company, Philadelphia, Pa. Formerly assistant manager of foreign sales, he succeeds E. B. ESTABROOK, who becomes a consultant. Mr. Roxby has been with L & N for more than 33 years.

RAY HERMANSON has been named advertising and market research manager for Western Precipitation Corporation, Los Angeles, Calif. Mr. Hermanson was formerly associated with Proto Tool Company and Brea Chemicals, Inc., in sales and advertising capacities.

Appointment of CORNELIUS WHETSTONE as marketing manager for Massey-Ferguson Industrial Division, Wichita, Kans., has been announced. He was formerly general sales manager of the Trojan Division of Yale and Towne Manufacturing Co.

Mr. Whetstone's appointment is part of a general merchandising expansion which the Massey-Ferguson Industrial Division reports has resulted in the franchising of 285 new dealers in the first three months of 1959.

Cornelius Whetstone

George L. Collier

The Dorsey Corporation has named GEORGE L. COLLIER president of Dorsey Trailers following the death of J. V. WRIGHT, former president. Mr. Wright had been with the company for 47 years. T. K. DORSEY was appointed executive vice-president.

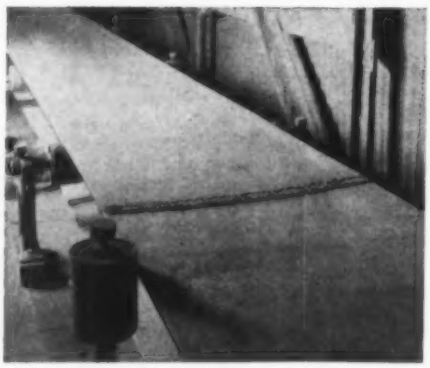
Mr. Collier has been in Dorsey's financial segment for ten years. Mr. Dorsey is the son of one of the founders of Dorsey and has served the company since 1939 in various phases of production and sales.

E. S. TWINING JR., formerly manager, gas department marketing, was appointed vice-president, marketing by Air Reduction Sales Company, New York, N. Y.

Mr. Twining has held various sales management positions during his 14 years with Air Reduction, including assistant sales manager of the Philadelphia district sales office and manager of Airco's Boston district sales office.

A new 20-minute 16 mm. motion picture, *Crawler Tractors in Action,* is now available on a loan basis from Allis-Chalmers Construction Machinery Division branches and dealers throughout the United States.

TOPS . . . functioning like new after 18 MONTHS AT 300 TONS PER HOUR!



Service as outstanding as this is the rule instead of the exception when CRESCENT Belt Fasteners are used. Furthermore, the faithful acceptance of CRESCENT Belt Fasteners over the years demonstrates conclusively that our original design for joining and repairing belting of any length, width and thickness is still tops in performance.

Solving tough problems in joining virtually any kind of belting has become an everyday occurrence with us. In brief, CRESCENT Belt Fasteners provide the fastest, most durable and most economical method of joining and repairing conveyor, elevator and transmission belting. Also, CRESCENT Rivets are self-piercing and self-clinching, thus no holes to align and bore. A hammer is the only tool required to execute any job.

A trial installation will verify the acknowledged fact that CRESCENT Belt Fasteners make belting give better service. Remember . . . our vast experience accumulated since 1897 is at your disposal without obligation. Get complete information today!

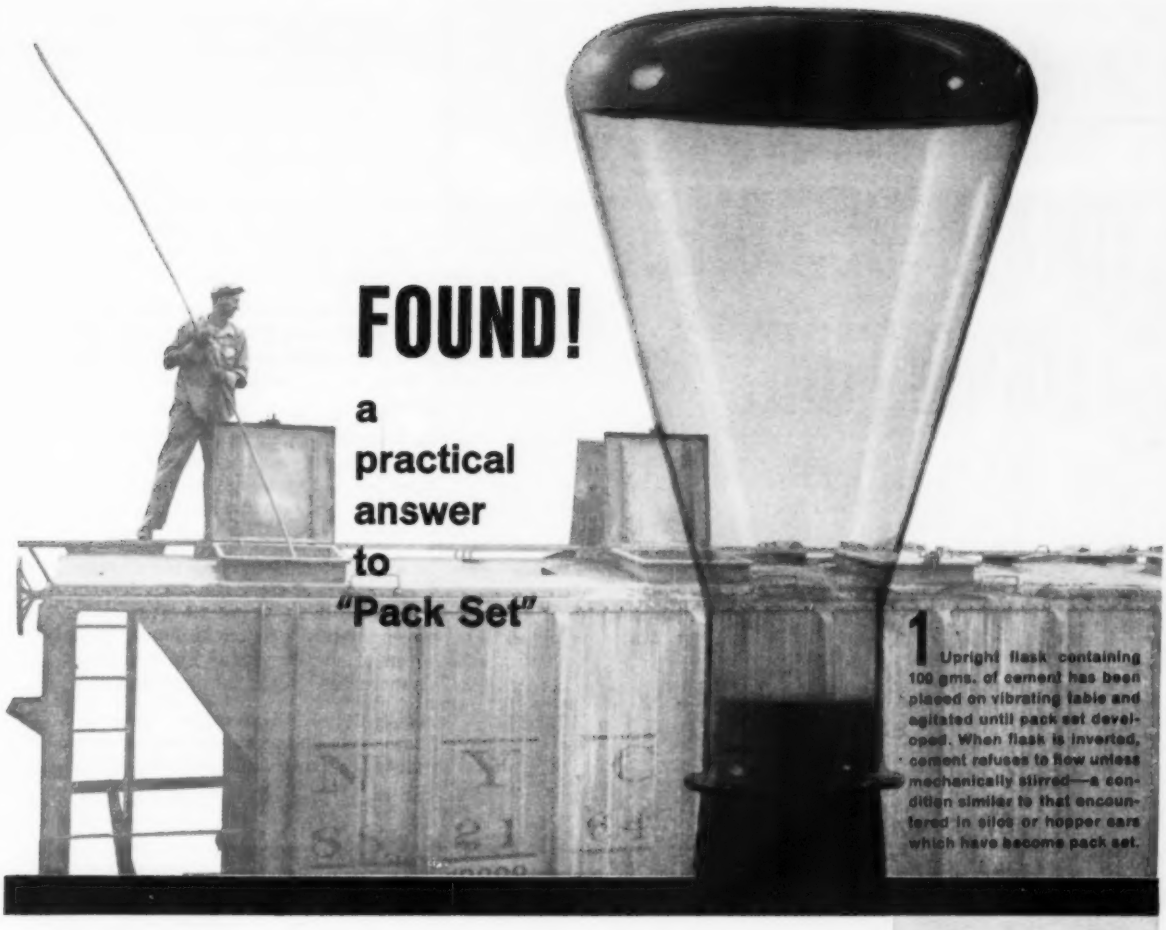
CRESCENT BELT FASTENER COMPANY

381 FOURTH AVENUE, NEW YORK 16, NEW YORK

65 Market Street, Toronto 1, Ontario, Canada — 32 Paradise Street, Birmingham 1, England

DISTRIBUTORS THROUGHOUT THE WORLD

Enter 184 on card, page 177



FOUND!

a practical answer to "Pack Set"

1 Upright flask containing 100 gms. of cement has been placed on vibrating table and agitated until pack set developed. When flask is inverted, cement refuses to flow unless mechanically stirred—a condition similar to that encountered in silos or hopper cars which have become pack set.

Dry dispersion with TDA

If you're paying good money to move "pack set" cement—or if your customer is—this message is meant for you.

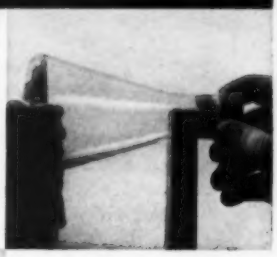
Pack set can be overcome *in the grinding operation.* The answer is Dewey and Almy's TDA, a dry dispersant.

Accepted by ASTM as non-harmful to cement, this product has been in use as a grinding aid for nearly a quarter century. Its effectiveness as a *pack set inhibitor* has been clearly established by the test method illustrated in these laboratory photographs.

Get the facts about TDA and dry dispersion. Check the coupon now and evaluate TDA in your own operations.

W. R. GRACE & CO.
DEWEY AND ALMY CHEMICAL DIVISION
Cambridge 40, Mass.

2 Now flask is placed on horizontal axis and gently rotated in half-turns until cement is loosened and flows once more. Number of half-turns is termed "Pack Set Index".



3 Laboratory demonstrations, substantiated by field experience, show that cement interground with TDA has a Pack Set Index one-third to one-fourth that of untreated cement . . . *flows three to four times more readily.*

Dewey and Almy Chemical Division, W. R. Grace & Co.
622 Whittemore Avenue, Cambridge 40, Massachusetts
Attention: Rock Products Chemicals Department

☐ Please forward the new TDA "Pack Set" Bulletin ☐ Please arrange a full-scale test grind in our plant

NAME.....
TITLE.....
COMPANY.....
ADDRESS.....
CITY.....ZONE.....STATE.....

Hypoid Single-Reduction Gears Make TIMKEN-DETROIT® LIGHTWEIGHT TANDEMS FIRST CHOICE

for plus-profit payloads!

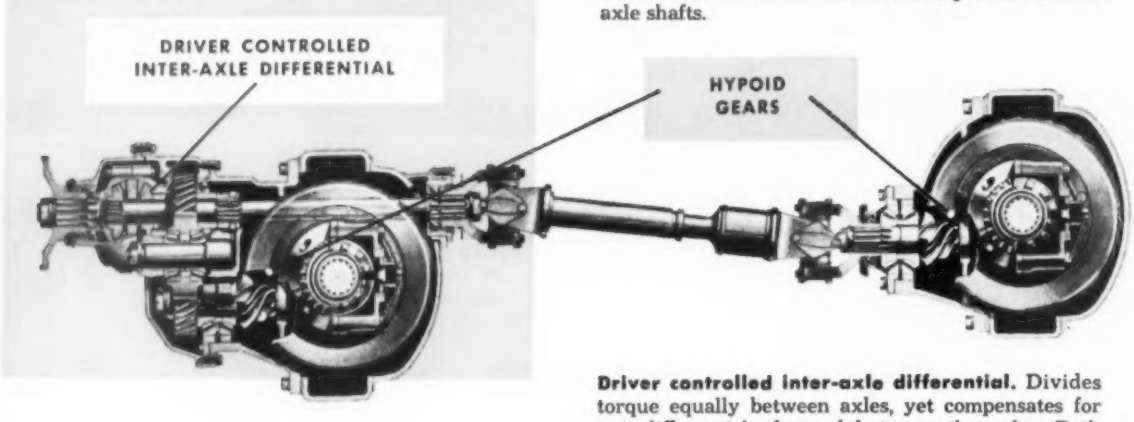
For more than three years Timken-Detroit Lightweight Tandems with Hypoid Single-Reduction Gears have been *first choice* with over-the-highway operators. Here are some of the reasons why:

Up to 700 lbs. lighter. Lighter in weight than other tandems currently available, Timken-Detroit's efficiency of design is unmatched in the industry. This not only means lower initial cost but *greater revenue from every payload.*

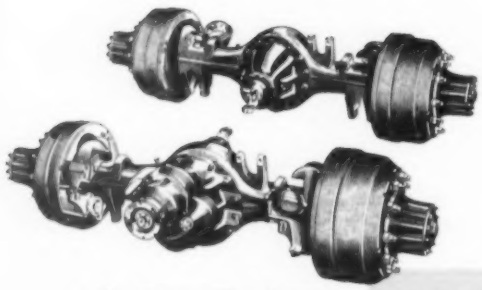
Hypoid gearing. Provides up to 30% more strength than spiral bevel gearing of the same size. Stronger design gives longer life and lower maintenance costs. To match hypoid gear performance, a spiral bevel gear must be larger and heavier.

Widest choice of axle ratios. Because of the stronger hypoid gear set, it is practical to provide high numerical axle ratios up to 8.6 to 1. To provide axle ratios greater than approximately 7 to 1 with spiral bevel gearing, some form of auxiliary ratio multiplication is required. This increases both weight and cost.

"In-Line" through drive. Eliminates compound angles, and reduces drive line wear and maintenance. Differential carriers are centered to permit common axle shafts.



Driver controlled inter-axle differential. Divides torque equally between axles, yet compensates for any differential of speed between the axles. Both axles are always doing equal amounts of work. Can be locked out at any speed when poor traction conditions exist.



Tough, Torsion Flow Axle Shafts Are Best By Any Test. Don't be misled . . . patented Torsion Flow Axle Shafts are still the best available to the American Trucking Industry. Comparison tests prove that Timken-Detroit Axle Shafts, spline diameter for spline diameter, are the toughest ever made.

World's largest manufacturer of axles for trucks, buses and trailers

©1959, R-S Corp.

Another Product of...

ROCKWELL-STANDARD CORPORATION

ROCKWELL R STANDARD®

Transmission and Axle Division, Detroit 32, Michigan

American Success Story Awards were recently presented by the Free Enterprise Awards Association, Inc., to eleven men whose up-from-the ranks careers symbolize the rewards of success possible under the United States competitive free enterprise democracy.

Among the recipients was GEORGE SPATTA, president of Clark Equipment Company, Buchanan, Mich. Born in New York City's "Hells Kitchen", Mr. Spatta is a Cooper Union graduate, and has risen from development engineer to head Clark Equipment. His inventions and direction brought the company to a front ranking position in the manufacture of materials handling and construction machinery, trailers and automotive components.

H. K. Porter Company, Inc., Pittsburgh, Pa., has sold the land and three factories of the Laclede Works of its Refractories Division, St. Louis, Mo. Porter has been operating only one of the three factories in recent months, and will continue to operate this plant with no change in present employment under a five-year lease agreement for use of this part of the property. The Laclede Works is one of 15 works of the Refractories Division of H. K. Porter Company, Inc.

A new merchandising program has recently been made available to industrial suppliers throughout the country by Flexible Steel Lacing Company, Chicago, Ill. The program centers around a counter display rack that contains several rolls of popular size V-belting (the cross-woven fabric construction type), Alligator V-belt fasteners, and simple application tools.

WARREN H. KINTZINGER, patent counsel for The Eimco Corporation with headquarters at the company's Salt Lake City main offices, has been installed as chairman of the Salt Lake Group of the Society of Automotive Engineers for the 1959-1960 period. This professional group represents the automotive engineers in Utah and is part of the National SAE.

PANGBORN DUST CONTROL REPAYS COST WITH PROFIT IN A YEAR!

Pangborn Dust Collectors save National Lead over $20,000 in recovered dust first year

The Baroid Division of National Lead Co., Houston, Tex., produces additives for use in oil well drilling mud. Because the dust resulting from crushing, grinding and bagging operations could be unpleasant for employees and surrounding neighborhood, National Lead installed a Pangborn Cloth Bag Dust Collector and a Pangborn Self-Cleaning Unit. Today management is enthusiastic over results! Not only have good employee and community relations been maintained, but Pangborn Dust Control has paid off in dollars and cents. In just the first year of operation, the two Pangborn Collectors salvaged enough dust to pay for both the collectors and installation and return a substantial additional saving to the company.

If dust is a problem in your plant, talk to the Pangborn man in your area or write PANGBORN CORPORATION, 5300 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Dust Control and Blast Cleaning Equipment—Rotoblast® Steel Shot and Grit.*

Pangborn CONTROLS DUST

Enter 187 on card, page 177

STARSTEEL
HEAVY DUTY **SPACE SCREENS**

The special alloyed high-carbon wire in tough, rugged STARSTEEL Screens has amazing resistance to abrasion—in some cases service life is double that of ordinary screens.

STARSTEEL's rigid, accurate weaving resists distortion—precision-applied hook strips make installation easier, insure tighter uniform tension, prevent breaking. But these are only three of the big reasons why STARSTEEL Screens last longer—cut replacement costs as much as half—reduce downtime and maintenance—promise uniformly better finished products.

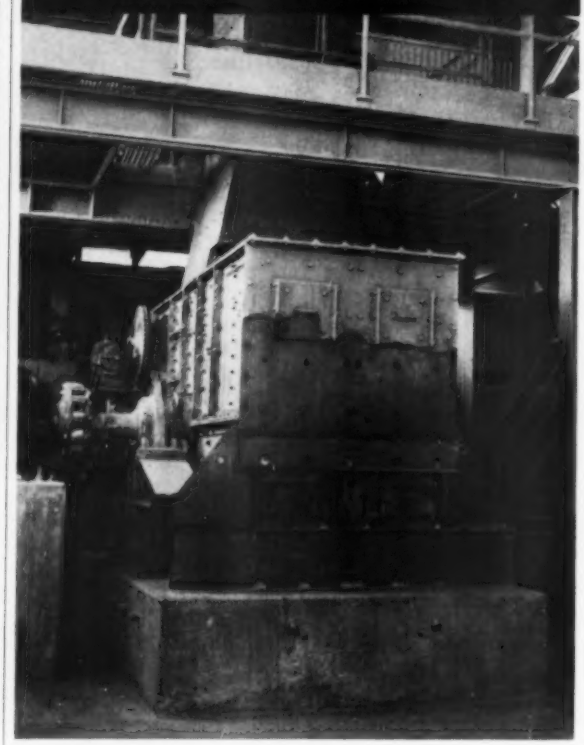
STARSTEEL "double duty" Screens are always sharply competitive in price. *Write for catalog.*

Fast Shipment from stock on most weaves and sizes.

Star will produce screens or cloth from stainless or other steel alloys, Monel, brass, bronze, copper, aluminum or any metal that can be drawn into wire. Inquiries invited.

STAR
WIRE SCREEN & IRON WORKS, INC.
2515 San Fernando Road • Los Angeles 65, Calif.
Subsidiary of Ludlow-Saylor Wire Cloth Company, St. Louis, Mo.

Another size reduction problem solved by Hammermills, Inc.



Bulldog Non-Clog Hammermill

Crushes 375 to 400 tons wet limestone per hour

Limestone fed to this primary Hammermill at a new Midwestern cement plant contains 12% silica. It is mixed with clay and is high in moisture. The Bulldog Non-Clog Hammermill crushes this material at a rate of 375 to 400 tons per hour with a power consumption of 600 h.p.

Bulldog Non-Clog Hammermills are known throughout the industry for their ability to handle tough jobs. They'll give more capacity per horsepower. They require less maintenance.

Hammermills, Inc. can help you lower costs and increase your capacity. For the names of the Hammermills representative in New York, Chicago, St. Louis, Toledo, Dallas, Denver, Los Angeles, and Melbourne, Fla., simply write us.

Manufacturers of Hammermills for primary and secondary crushing • Impactors • Jaw Crushers • Roll Crushers • Cone Crushers • Wobbler Feeders • Apron Feeders

HAMMERMILLS, INC.
Subsidiary of **PETTIBONE** Mulliken Corp.
625 C Avenue N. W., Cedar Rapids, Iowa

Enter 188-A on card, page 177 Enter 188-B on card, page 177

Here's proof of economy with FALK Shaft Mounted Drives

PROBLEM—For many years, a prominent Eastern abrasives manufacturer* experienced high maintenance and down-time costs, as well as excessive noise and vibration, in the operation of 19 pebble mills driven by open spur gears. Drive gears and jack shaft pillow blocks required frequent repairs or replacement, and trunnion shafts often failed, due to radial overloading of the bull gear when broken pinion teeth bottomed between gear teeth.

SOLUTION—After numerous unsuccessful approaches to these problems, the solution was found by mounting a Size 315J FALK Shaft Mounted Drive directly on the mill drive trunnion. This eliminated objectionable gear noise and vibration...greatly reduced costly down-time and loss of production...and cut annual maintenance and replacement expenses as indicated by the following figures taken from the customer's records:

Spur Gear-and-Pinion Drive		FALK Shaft Mounted Drive	
Bull Gears	$ 56	VEE Belts	$ 30
Pinions	120	FALK Shaft Mounted Drive (based on 10-year life)	70
Pillow Blocks	90		
VEE Belts	30		
Trunnion (5-year life)	100		
Annual cost	$396	Annual cost	$100
		ANNUAL SAVINGS	$296

IF OBSOLETE DRIVES ARE COSTING YOU MONEY, a change to Falk All-Steel Shaft Mounted Drives can effect important savings in money and production. Used on almost any type of machine, these compact, rugged units are establishing new standards of economy and efficiency in many industries. Specify FALK Drives on your purchased equipment...For full details, **write for Bulletin 7100.**

*Name on request

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

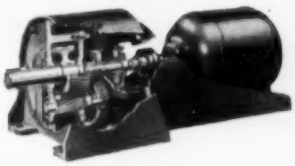
Representatives and Distributors in Most Principal Cities

To get the right drive for your application, specify FALK®

SHAFT MOUNTED DRIVES

Horizontal or vertical units—½ to 50 hp—420 to 5 rpm—single and two double reduction ratios—output torque ratings up to 41,000 lb-in (consult factory for higher torque capacity).

• • •



ALL-MOTOR® MOTOREDUCERS

Sizes up to 75 hp—furnished with or without standard foot-mounted motor—standard output speeds 1.2 to 520 rpm (with 1750 rpm motors)—ratios as high as 54,000:1 in semi-standard designs. Integral units (gearmotor type) also available. Ask for **Bulletin 3100.**

• • •

FALK Drives are available from factory and distributor stocks from coast to coast. Consult your Falk Representative or Distributor.

FALK

...a good name in industry

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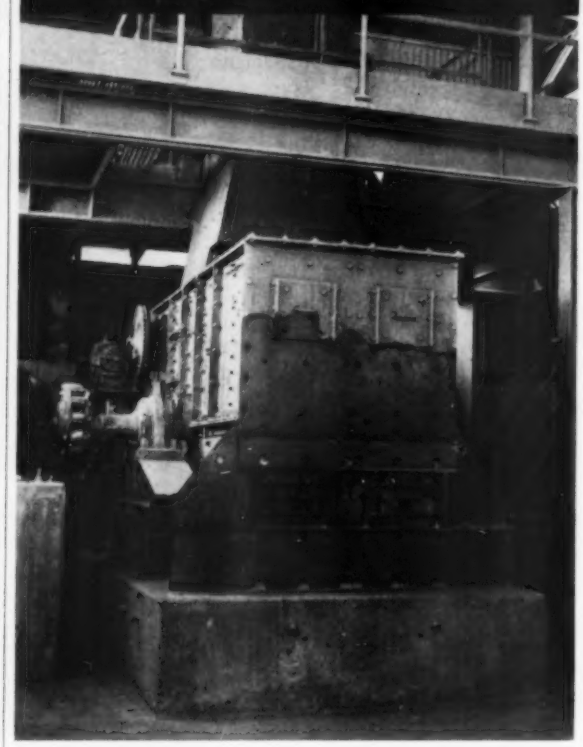

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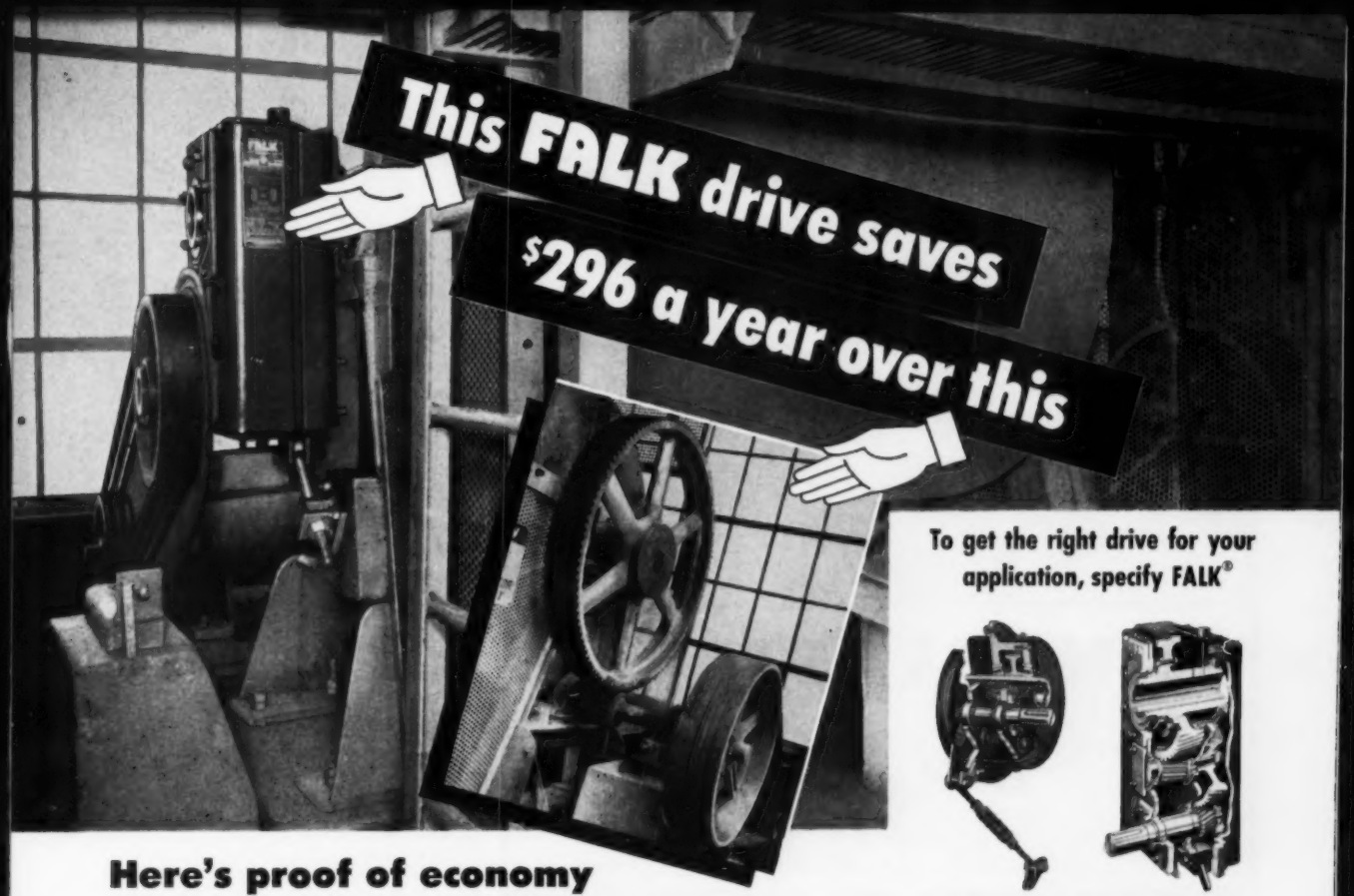

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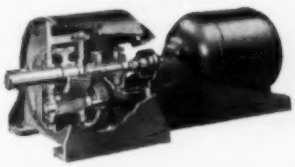

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• • •

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FALK

...a good name in industry

The new standard for kiln ring removal

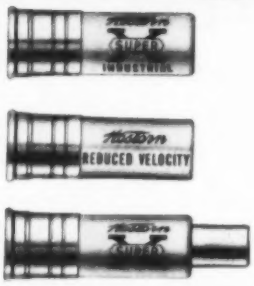
RINGBLASTER®
MARK-1
KILN GUN

and Western®
INDUSTRIAL AMMUNITION

Super-X Shell — For use in kilns over 150' long. Develops 8900 ft. lbs. of muzzle energy — breaks hardest rings quickly and efficiently.

Reduced Velocity Shell — Lower-powered (approximately 7500 ft. lbs. muzzle energy) for ultimate efficiency in shorter kilns . . . minimizes possibility of damage to end plates, feed pipes, etc.

Super-X Zinc Shell — Extra-large zinc slug *penetrates* toughest rings. Use with Super-X lead slugs for maximum penetration and "knock-down" power.



Every day kiln operators are adopting Ringblaster, with custom-powered Western ammunition, for faster, easier ring removal. Regardless of conditions, this hard-hitting team does a better job of smashing the toughest thickest rings systematically and efficiently.

Job-proven and widely accepted by the industry, Ringblaster and Western offer amazing advantages in keeping your kilns running at peak capacity. Put Ringblaster and Western to work for you . . . send for illustrated pamphlet and details today on how this system can save you money!

In addition to Ringblaster®, the versatile Ramset System includes Ramset powder-actuated and Shure-Set® hammer-in tools and fasteners.

KILN *RINGBLASTER* GUN

Ramset Fastening System

WINCHESTER-WESTERN DIV. · OLIN MATHIESON CHEMICAL CORPORATION
289 WINCHESTER AVENUE · NEW HAVEN 4, CONNECTICUT

Enter 190 on card, page 177

In a move to increase its domestic and foreign sales and product development activities in quarry and mine blast-hole drilling and other operations using rock bit cutting structures similar to those on the rotary rock bit, Hughes Tool Company, Houston, Texas, has organized an industrial sales section.

LEON B. STINSON, previously director of sales training for Hughes and a 21-year veteran with the company, has been named manager of the industrial sales section. Assistant to Mr. Stinson is ROY M. GOOLSBAY, a representative in the general sales department since 1947, who has specialized in sales to quarries and construction last-hole drilling. Mr. Goolsbay joined Hughes in 1936. Both men will continue to maintain headquarters in Houston.

S. B. PLUMMER JR., will be coordinator of industrial sales, with headquarters in Olney, Illinois. With Hughes since 1943, Mr. Plummer has been a special sales representative in industries other than petroleum since 1952. Other assigned to the new section include R. J. RUBY, Phoeniz, Ariz.; R. C. HANSEN, Salt Lake City, Utah; R. E. PRICE, Bethlehem, Pa.; PRENTISS SEALE, Mt. Iron, Minn.; and C. L. SCOTT, St. Clairsville, Ohio.

Equipment Corporation of America, rebuilders and suppliers of industrial and contracting equipment announced the election and promotion of several new officers at a special shareholders and directors meeting held in Philadelphia.

MARSHALL E. JOST, became chairman of the board, a new office. Also elected were L. T. KERN, president; R. S. PERKINS, vice-president; WARREN HURLEY, treasurer; and GEORGE M. MILLER JR., secretary.

The A. P. Green Fire Brick Company announced the appointment of HUGH LOWRY as sales representative of the company's Memphis territory. Prior to his present appointment, Mr. Lowry, who has been with the Green Company for 13 years, was a sales representative for Illinois A. P. Green Fire Brick Co., a Chicago affiliate.

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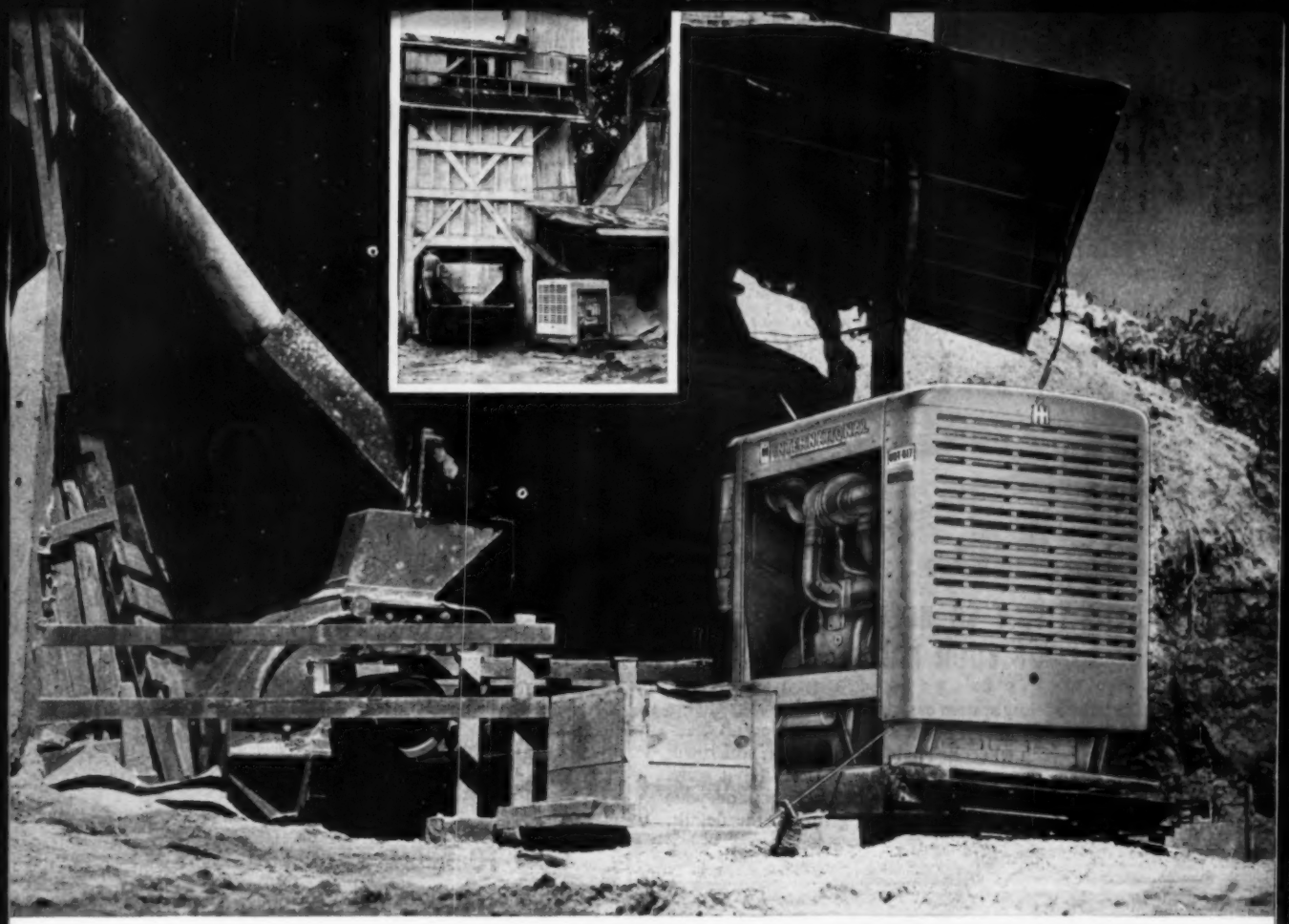


DEPENDABLE POWER WALLOP Jonesboro Stone Co., Anna, Ill., needed to increase production and practically powder ag lime is supplied by this International UDT-817 turbocharged diesel delivering 265 cont. hp. @ 1,800 rpm.

Gets 25% more lime, finer screening with UDT-817 engine

Missouri farmers and farm suppliers come as far as 100 miles for agricultural lime with excellent calcium content produced by the Jonesboro Stone Co., Anna, Ill.

Demands for greater production and finer screening to satisfy Missouri farm officials caused owner Waldo Wright to make equipment changes—a bigger Cedar Rapids 40 x 33 hammermill for final crushing with a new International UDT-817 turbocharged power unit supplying 265 cont. hp. @ 1,800 rpm.

Benefits: an immediate 25% production increase from 60 to 75 tons hourly plus the ability of the new equipment to reduce 6-in. limestone rocks to 50% through a 40 screen for unquestioned product acceptance.

Waldo Wright reports, "I chose the new International UDT-817 for two reasons: 1) it came closest to the hp. requirements needed; and 2) the International engine carries better continuous horsepower than the diesel I had been using."

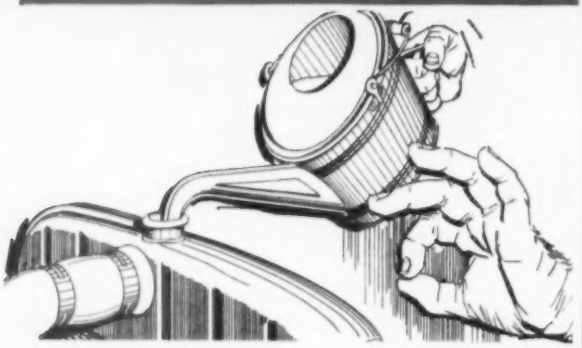
International diesel engines give you fastest payback power in pits and quarries for four big reasons: 1) lower maintenance; 2) full rated power; 3) unexcelled field service; and 4) genuine parts availability. Check your International Power Unit Distributor or Dealer. He can show you 10 diesels ranging from 70 to 385 max. engine hp.

International® Construction Equipment

International Harvester Co., 180 N. Michigan Ave., Chicago 1

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

LUBE LOGIC



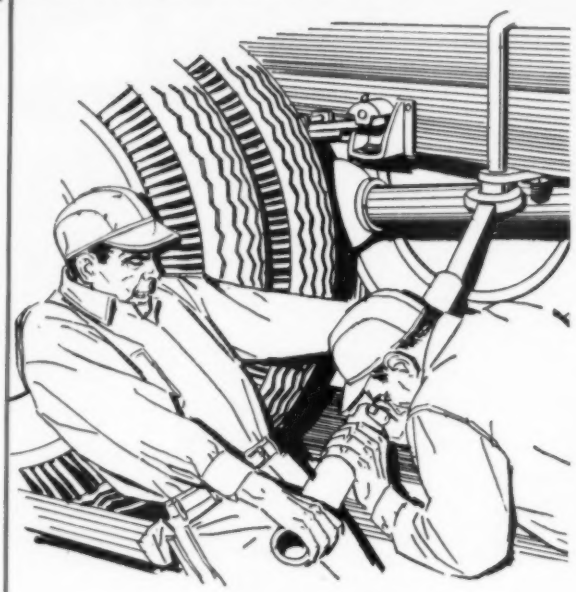
NEW WAY TO KEEP RUST OUT OF YOUR RADIATOR

Rust in your cooling system can start damaging your engine long before your radiator blows its top. It will slow up water circulation, which will raise engine temperature, which will raise havoc with engine performance. Don't let it start. A little Texaco Soluble Oil C in your radiator and your troubles are over. Your TAE* can give you the details.

EASY WAY TO AVOID BATTERY DEPOSITS

Don't let battery deposits climb up your cables; you may want to get them off someday. Easiest way to keep this from happening: paint battery terminals with Texaco Rustproof L. One application will keep them deposit-free for months.

Four ways to lighten your load this month



HOW TO AVOID THAT FROZEN BOLT

Ever spend six hours fighting a U-bolt that's decided to corrode itself tight? We've seen it happen, and it's an unforgettable experience—especially when we told them they could have ducked all that trouble for the price of a pack of gum. When they let us back in, we showed them how just a dash of Texaco Threadtex could keep their bolt rust-free permanently. Ask your TAE* for a demonstration.

*TEXACO AUTOMOTIVE ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Automotive Engineer is the best source of money-saving lubrication ideas. Don't forget that "lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

TUNE IN: TEXACO HUNTLEY-BRINKLEY REPORT, MON-FRI.—NBC-TV

TEXACO

Throughout the United States
Canada • Latin America • West Africa

LeRoy M. Hosick

Henry B. Korman

The promotion of HENRY B. KORMAN and LEROY M. HOSICK to the positions of director of sales, and sales manager, respectively, has been announced by the Upson-Walton Company, Cleveland, Ohio.

In addition to directing the sale of Upson-Walton products, Mr. Korman and Mr. Hosick will supervise distribution of products through all divisions, company branch offices and sales representatives. Both men have served the company in various sales and sales management capacities.

Disogrin Industries, Inc., Mount Vernon, N. Y., recently announced the creation of two separate sales divisions. The Disowheel Division, managed by Joseph A. Gagen, will be responsible for the sales and service to Disowheel customers. Mr. Gagen will supervise the national distributors sales organization as well as sales to material handling equipment manufacturers. He joins Disogrin after 17 years' experience selling industrial wheels and tires.

The other division, the Disogrin Products Division, is headed by Kenneth H. Grim. The division will be in control of all applications and sales of Disogrin products other than Disowheel. Mr. Grim will administer the activities of the company's internal sales force which includes searching for new applications and servicing of Disogrin products customers. His experience in industrial sales engineering includes service with the W. M. Kellog Co., and the Combustion Engineering Company.

ARTHUR W. FASOLD has been appointed assistant general sales manager of Hewitt-Robins, Inc., Stamford, Conn. He has been with the firm since shortly after World War II.

The Calumet Division of Calumet and Hecla has increased its range of production of Ni-Hard grinding balls. They now stock sizes from ⅝ in. through 2 in.

Calumet & Hecla began making Ni-Hard balls in 1953 after many years of making Ni-Hard castings of ball mill liners, pump shell liners, impellers, and other abrasion resistant parts. The balls were made commercially available in 1954 with the cement industry one of the major users.

Organization of three overseas corporations has been announced by Chain Belt Company, Milwaukee, Wis. They are Rex-Chabelco A. G. in Switzerland, Rex-Regina S. A. in Italy, and Chain Belt (Japan) Ltd.

Rex-Chabelco A. G., a wholly-owned Chain Belt subsidiary, is primarily to provide central control and technical assistance to the company's European operations. Fifty percent of Rex-Regina S. A. is owned by Chain Belt's Swiss subsidiary and the balance by Societa Italiana Catene Calibrate Regina.

Rex-Regina is building a new plant in Olginate, also near Milan, where it will make steel roller chains of ¾-in. and heavier pitch for power transmission and conveying. It will handle distribution of the new products in Italy, and Chain Belt's export sales organization will be responsible for sales in other areas.

Chain-Belt (Japan) Ltd. will manufacture self-priming centrifugal pumps, truck-mounted concrete mixers, building mixers and *Pumpcrete*. These products will be sold throughout Asia and the Philippines.

CARLTON B. SMITH, director of service for Allis-Chalmers Industries Group, died July 6, in Milwaukee. He was 63. Mr. Smith began working for Allis-Chalmers in 1914 as a machinist apprentice, and three years later became a field service and erection supervisor. In 1951 he became manager of the service and erection department, and in 1957 he was named director of service. In his position, he was in charge of the installation and servicing of all of the products of Allis-Chalmers Industries Group.

NO SPOT FOR A BREAKDOWN!

KEEP IT GOING AT ITS BEST ...USE ONLY GENUINE HAYWARD REPAIR PARTS!

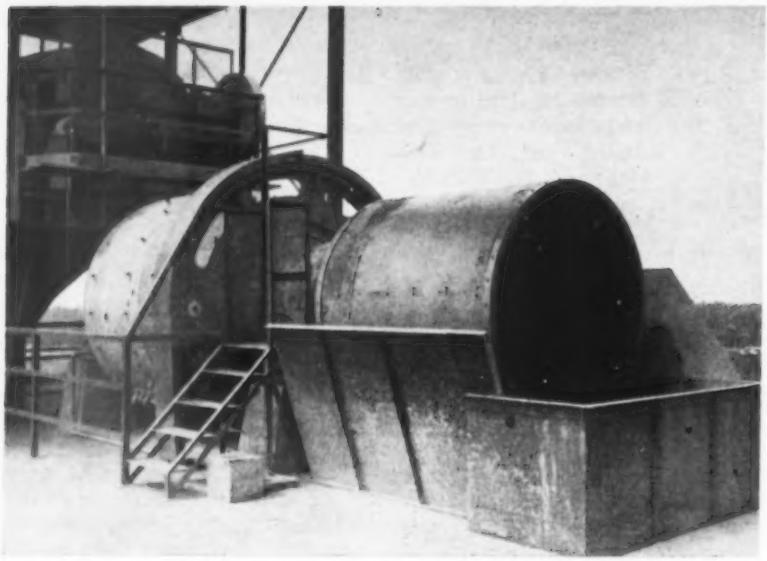
Hayward Buckets are designed with the most efficient construction features known. And only with *genuine* Hayward replacement parts can you be sure of maintaining that same high quality. Cheaper "bootleg" parts reduce efficiency, raise operating costs and disrupt schedules.

Anticipate any possible breakdown.
Write today for list of genuine Hayward parts.

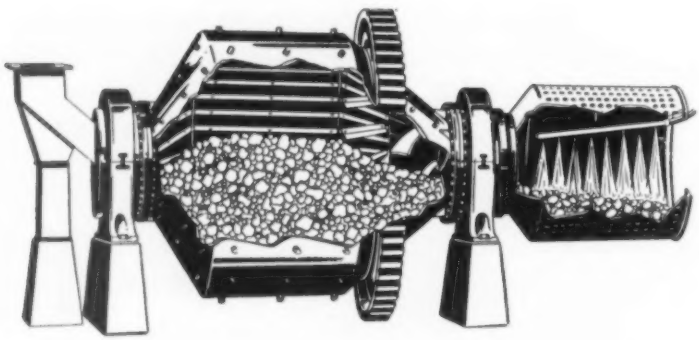
THE HAYWARD COMPANY
50 CHURCH STREET, DEP'T P, NEW YORK 7, N. Y.
Builders of Better Buckets Since 1888

Enter 193 on card, page 177

HARDINGE SCRUBBERS FOR PIT-RUN MATERIALS



The 8′ x 48″ Hardinge Conical Scrubber, above, with 6′ x 6′ dewatering screen kept a west coast sand and gravel firm in business, after their high grade deposit was exhausted—successfully removing large quantities of extremely sticky clay from their quarry stone. Hardinge conical scrubbers are in operation throughout the country, cleaning crude iron ore, sand, gold ore, dolomite, river gravel, and crushed stone of all types.



Large diameter, short length trunnions permit chute feeding of unsized ore and rock at rates up to 600 tons per hour.

The mass loading and ball-mill action in the scrubber quickly and completely slurries the clay and dirt, permitting ready separation on washing screens or trommels.

Write for Bulletin 37-B-8

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 ARCH ST. • Main Office and Works

New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco • Birmingham • Jacksonville Beach

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Aerotec Industries, Inc., announces that the merger of the Prat-Daniel Corporation, South Norwalk, Conn., The Aerotec Corporation and The Thermix Corporation of Greenwich, Conn., and The Aerotherm Corporation of Bantam, Conn., went into effect in July when directors met for the first time in Greenwich.

The combination was approved by stockholders of the four merged companies in late May. Executive offices of the new corporation will be in Greenwich. The following officers of the new corporation took office: LOUIS C. WHITON, chairman of the board; JOHN E. WATSON, president; JACQUES G. MEJEAN, executive vice-president and treasurer.

Aerotec Industries, Inc., will continue to market all the products of the merged corporations. The Industrial Division that designs and manufactures dust collectors, electrical precipitators, curtain dampers, blowers, fans, gas scrubbers, fan-stacks and other heavy industrial products will continue operations at both the Greenwich facilities and the Prat-Daniel plant in South Norwalk.

T. C. Chown Limited, Montreal, Canada, was appointed Canadian affiliate of the newly formed firm. Chown will function as project engineers and will fabricate in Canadian plants the three main product groups.

The Yale and Towne Manufacturing Company, Philadelphia, Pa., has announced two new appointments within its Yale Materials Handling Division. EDWARD D. HOBEN is now chief engineer—government contracts. He will coordinate activities between the various product engineering departments of Yale and the recently formed Government Defense Products Division which represents Yale Materials Handling Division in Washington, D.C.

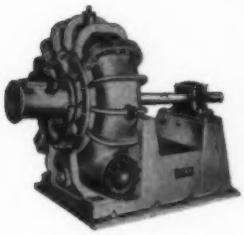
HARRY HEIN is now an electric truck sales engineer. In his new post, Mr. Hein will coordinate Yale's electric truck engineering capabilities with the activities of the Yale sales department. The company reports this engineering coordination will be particularly beneficial in the development of larger capacity, custom built trucks for which demand is steadily increasing.

Ex-cowboy lays down his lariat!

Old Indian Fighter Sam Sanders, Drops His Six-shooter To Boast About His

THOMAS
DREDGE PUMP

Sam Sanders, former cowboy in old Indian Territory, now a prominent sand and gravel producer of Portales, New Mexico.



Thomas Pump Model (Series JL) which Mr. Sanders now uses.

Sam Sanders' sand and gravel dredge on man-made lake, largest body of water within radius of 125 miles.

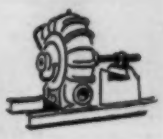
On a man-made lake, in the treeless, arid, mesquite-covered high plains of eastern New Mexico (elevation approx, 4,000′) Sam Sanders—Sand & Gravel Company since 1954 has operated a 10″ discharge Series JL Thomas DURABLE Dredge Pump. Mr. Sanders' sand and gravel business is a very substantial operation, supplying aggregate materials to a large area.

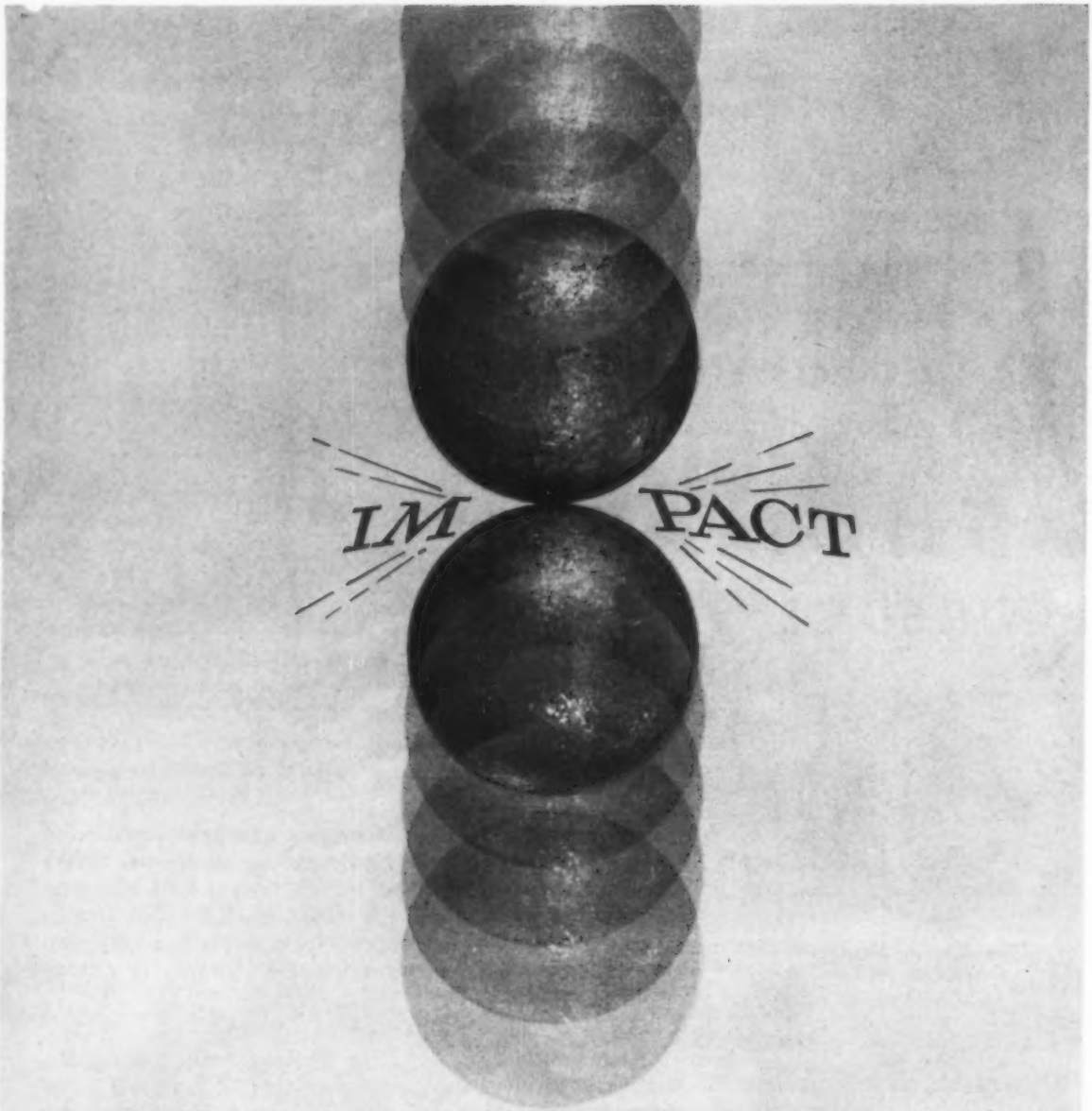
"I am enthusiastic about my Thomas Pump," states Mr. Sanders. "My Thomas Pump experience of nearly 5 years proves conclusively that its working parts have amazing long life against abrasion wear, resulting in low maintenance cost, less downtime for repairs, and excellent service from the Manufacturer. I am now planning to install another Thomas pump to replace my booster pump of a different make."

Mr. Sanders' experience again proves that "You cannot buy at any price a more durable pump for sand and gravel—you cannot buy one that will make you as much money." (Range of sizes is from 6-inch to 16 inch.)

THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA





MAKES DUST OUT OF MOUNTAINS

Coates Carbex Grinding Balls are made of fine-grained, high-carbon steel. They are especially forged to attain more perfect sphericity, then heat treated to extreme hardness, but with toughness to withstand the IM PACT of milling without shattering.

Coates Grinding Balls have been proven "best buys" in actual production run tests, yet Coates conducts a continuing research program to improve its already highly rated product.

Call for Coates Triple-Forged Grinding Balls . . . built with care for longer wear.

Write for prices . . . All sizes—½" to 5" carried in stock for immediate shipment.

COATES STEEL PRODUCTS CO. CARBEX TRIPLE-FORGED BALLS

COATES

STEEL PRODUCTS COMPANY

GREENVILLE, ILLINOIS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

L. L. CALLANDER has been appointed assistant sales manager of Pioneer Engineering, Minneapolis, Minn., division of Poor & Company, Inc.

A 15-year service veteran with the firm, Mr. Callander was manager of equipment orders just prior to his new post.

L. L. Callander

J. L. Janda

A new sales territory has been established in Scottsbluff, Nebr., by the Chase Bag Company, New York, N. Y. The representative in charge is J. L. JANDA who has been with the firm since 1940 and was most recently manager of its office in Denver. The new territory includes western Nebraska, western South Dakota, eastern Wyoming, northern Colorado and northwest Kansas. It was formerly serviced direct by Chase from its Kansas City sales office.

The Highway Equipment Company, Cedar Rapids, Iowa has three new distributors of its *New Leader* line. Flasco Body & Equipment Company, Sioux Falls, So. Dak., will serve South Dakota, and four counties each in Minnesota and Iowa. Equipment Service, Inc., Hartford, Conn., will serve Connecticut. Dealers Truck Equipment Company, Inc., Shreveport, La., will distribute in Louisiana except for the eastern section of the state.

ELWOOD CONE has been named administrative assistant to P. H. Mulcahy, general manager of WEMCO, a Division of Western Machinery Company, San Francisco, Calif. Mr. Cone will carry out specific projects involving all phases of the San Francisco firm's operations. Before joining WEMCO, Mr. Cone was chief engineer of the Shanzer Manufacturing Company of San Francisco.

The Yale & Towne Manufacturing Company has appointed four new distributors for its Trojan tractor shovel line. The G. C. Phillips Tractor Company, Inc. with main offices in Brimingham, Ala., and a branch at Mobile, is the Trojan distributor for the State of Alabama and all counties west of the Apalachicola River in Florida.

The Malette Construction Equipment Company, Sault Ste, Marie, Mich., is the Trojan distributor for the upper Michigan peninsula. George C. Gilbert, Inc., Kingston, N. J. is the Trojan distributor for all counties in New Jersey, north of and including Hunterdon, Somerset, Middlesex, and Monmouth Counties. The Dimond-Colloton Equipment Company, with headquarters in Milwaukee, Wis., and a branch at Madison, Wis., is the Trojan distributor for the State of Wisconsin.

WEMCO, a Division of the Western Machinery Company of San Francisco, Calif., has named five new distributors for its line of aggregate processing equipment.

Construction Equipment Company, of Birmingham Ala. will serve the state of Georgia and the western part of Florida. The Telford Equipment Company, Lansing, and the Telford Equipment Company of Detroit will serve the Lower Peninsula of Michigan.

The Power Equipment Company of Knoxville, Tenn. will distribute WEMCO aggregate equipment in western Tennessee.

In metropolitan Chicago, Cook County, and Lake County, WEMCO's distributor will be Lowe Machinery Company of Skokie, Ill.

Hewitt-Robins Incorporated, Stamford, Conn., has announced the establishment of a new foreign subsidiary in Brussels, Belgium called Hewitt-Robins International, S.A. The new company will direct Hewitt-Robins sales, manufacturing and licensing activities in Great Britain, Holland, France, Italy, South Africa, Germany and Japan.

THERE IS THE RIGHT BIT FOR YOU OUT OF THE MANY POSSIBLE COMBINATIONS OF SIZES AND TYPES

Write today . . . giving all information you can provide. Out of the many combinations possible with four matrices, several stone size ranges, three grades of diamonds, and various face contours we will recommend the bit we believe to be the best suited for your drilling conditions.

Always specify Sprague & Henwood "Oriented" Diamond Bits. They are described and illustrated in Bulletin 320-1.

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.
MEMBER OF: DIAMOND CORE DRILL MANUFACTURERS ASSOC.
New York — Philadelphia — Atlanta — Pittsburgh — Grand Junction, Colo. — Buchans, N.F.
EXPORT SALES: SPRAGUE & HENWOOD INTERNATIONAL CORPORATION, 11 W. 42nd ST., N. Y., N. Y.
Enter 197 on card, page 177

New
CYCLO-TRELL
MECHANICAL
DUST COLLECTORS

These new Cyclo-trells can be built to fit any specific job. Available in Types C-10 (10″ diameter), C-24 (24″ diameter), IC (involute Cyclo-trell), ICL (involute Cyclo-trell, lined) and C-24-L (24″ lined). Also available: a new hopper discharge valve.

Write now for your copy of new Bulletin 300 which gives details and illustrations of the new Cyclo-trells and hopper discharge valve.

Research-Cottrell, Inc.

RESEARCH COTTRELL INC. TRADEMARK RC203

Main Office and Plant: Bound Brook, New Jersey

REPRESENTATIVES IN PRINCIPAL CITIES OF U.S. AND CANADA

LORAIN ALL THE WAY—MOTO-LOADER AND LORAIN-26 SHOVEL BOOST STONE OUTPUT

At French Lick, Indiana, a heavy-duty ¾-yard Lorain-26 shovel and a 1¾-yard Moto-Loader Model ML-153 can each handle as much as 100 yards of shot rock an hour.

Wm. Cave Stone Company uses its rugged Lorain-26 to work along a 20 to 50 foot face. Here's where Lorain's heavy-duty design and cycle speed pay off. Power plant, clutch and hoist shafts are positioned to contribute to a counterweight effect. This husky construction without excess weight, plus easy-to-operate controls make the "26" a high production machine.

Teammate in this operation is the mobile ML-153 Moto-Loader. Besides supplementing the Lorain-26 at the quarry face filling trucks with shot rock, this versatile loader fills bins at the crushing plant . . . stockpiles crushed limestone . . . loads out six sizes of crushed stone into trucks.

Scampering around an 11-acre area calls for Moto-Loader maneuverability. With Lorain's exclusive one-foot-travel control, the operator maneuvers forward or backward as fast or slow as he wants . . . uses his hands for other operations. Balanced weight distribution lets the Moto-Loader carry more without bounce or jiggle.

It all adds up to faster handling all along the line . . . keeps trucks on the move. For details, see your Lorain distributor.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®

ON THE MOVE

PLANTS in Lorain, Elyria and Bucyrus, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler mountings from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 1¾- and 2-yard models.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

Dorr-Oliver Incorporated, Stamford, Conn., announces the retirement of ARTHUR TERRY JR. as vice-president for international administration and as a director of the company. Closely associated with D-O international business affairs for most of his 38 years of service, Mr. Terry will continue to serve Dorr-Oliver after his retirement as a consultant in the international field. Vice-president Douglas C. Reybold, former director of technical operations, has assumed guidance of all international operations.

ROSS C. BYERS has been appointed acting works manager of Bucyrus-Erie Company's plant in Evansville, Ind. He had been general superintendent of manufacturing at the Erie plants of Bucyrus-Erie.

M. R. WILKENS has been appointed to the newly-created position of sales planning manager of the industrial products divisions, Hewitt-Robins, Inc., Stamford, Conn. He will co-ordinate marketing efforts on major inquiries with field sales and the manufacturing divisions, working under the direction of A. W. FASOLD, who is in charge of sales services.

The appointment of WILLIAM J. BRICKLEY as manager of labor relations has been announced by SKF Industries, Inc., Philadelphia, Pa. Mr. Brickley joined SKF as assistant labor relations manager in 1957. He succeeds Donald B. Cutler, who has resigned.

ROBERT M. HANSEN has been appointed business development engineer for the Western-Knapp Engineering Company, San Francisco, Calif., and will be located in Salt Lake City. Before joining WKE, he had been associated for the past 12 years with the WEMCO and the Industrial Sales Divisions of the Western Machinery Company in the Salt Lake City and northwest area.

EDWIN T. GOREE has been appointed vice-president in charge of sales for the Koehring Division of Koehring Company, Milwaukee, Wis. Before joining Koehring, Mr. Goree was associated for 12 years with the Bucyrus-Erie Company in sales representative and sales management capacities.

Edwin T. Goree

J. E. Sheets

J. E. SHEETS has been named eastern sales manager for LeTourneau-Westinghouse Company, Peoria, Ill. The appointment places him in charge of operations of the company's eastern sales division comprising 22 states and 5 Canadian Provinces.

Mr. Sheets became an industrial engineer for L-W in 1951. In 1952, he was assigned to the Washington office of the company's government sales department. In 1955 he became manager of that office where he has served until his recent appointment.

MARTIN L. CASE has been appointed assistant manager of International Harvester Company's Melrose Park, Ill., Works. Mr. Case, who was general superintendent there, succeeds EARL P. DACY who has become manufacturing manager of International Harvester's Australian subsidiary. WARREN A. MORTONSON is the new general superintendent at Melrose Park.

New headquarters for the Stardrill-Keystone Company, recently acquired division of Koehring Company, Milwaukee, Wis., have been announced. Formerly located at Beaver Falls, Pennsylvania, the firm has moved to Springfield, Ohio. The drill manufacutrer will occupy 189,000 square feet in a plant established by another Koehring Division, the Buffalo-Springfield Company.

RUGGED

Raymond MULTIWALL BAGS serve the Building Trades

Raymond Bag Corporation
Middletown, Ohio
A Division of Albemarle Paper Mfg. Co.

District Offices:
New York • Chicago • Kansas City Baltimore

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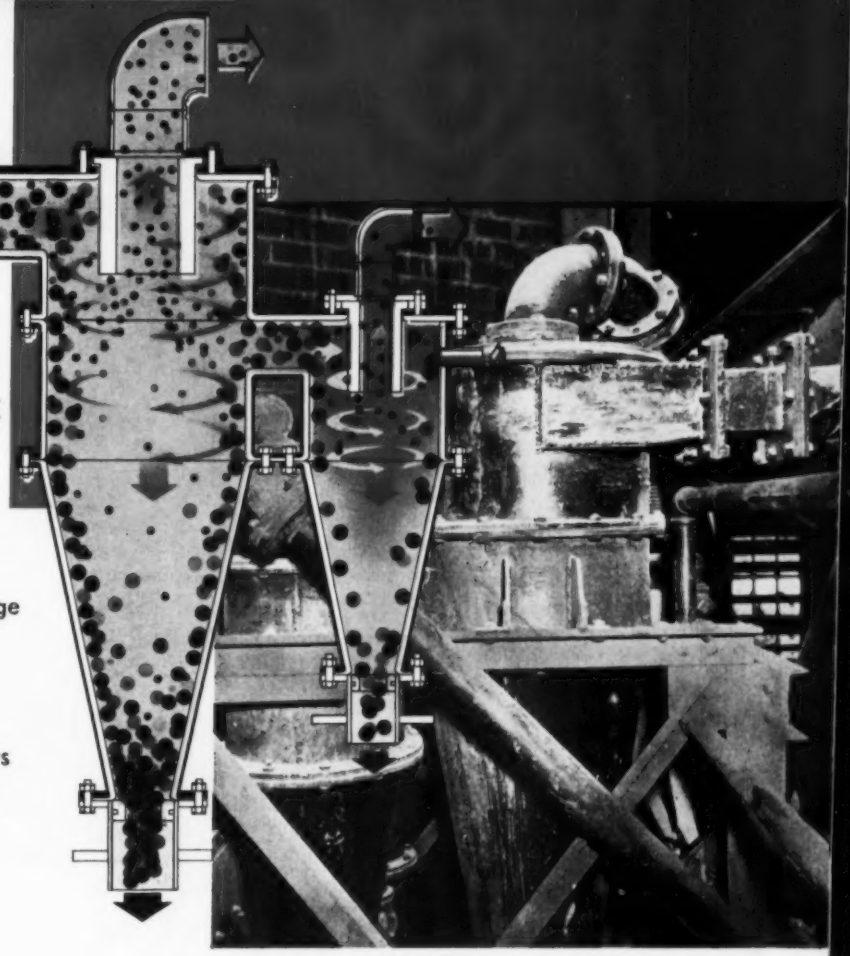
Enter 201 on card, page 177 →

DENVER - MORTON DUPLEX* CYCLONE CLASSIFIER

*PATENTED



Now!...

from DENVER...

a specially engineered DUPLEX Cyclone Classifier that—

(1) **Produces Cleaner, Higher Density Sand Product**

than is possible with single-stage conventional wet cyclones.

(2) **Is Self Regulating**

—handles surges or peak flows that would plug conventional wet cyclones.

(3) **Uses Water to Wash Slimes From Sand**

to give sharp separation, clean, slime-free product.

Complete details on the DENVER-Morton Duplex Cyclone Classifier will be sent to you on request. Write today!

"The firm that makes its friends happier, healthier and wealthier"

DECO ENGINEERED STANDARD RELIABLE 24 HOUR SERVICE EFFICIENT

DENVER EQUIPMENT COMPANY

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Phone CH 4-6310

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Finsbury Square
Phone Monarch 3750

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Bez Valley
Phone 25-7531

TORONTO
185 Bay Street
Phone EMpire 3-8836

VANCOUVER
802 Credit Foncier Bldg.
Phone Marine 4918

MEXICO CITY
Avenida Juarez 14, Desp 615
Phone 211477

LIMA
AVDA Orrantia 1570
San Isidro

ROBERT A. BARR has been appointed general manager of the Babcock & Wilcox Company's Refractories Division. He will make his headquarters in the company's New York offices. Mr. Barr formerly was assistant general manager of the Refractories division of the Carborundum Company where he gained more than 30 years' experience in the refractories field.

Appointment of Central Machinery Company, Abilene, Texas, as distributors of the *Michigan* line of construction machinery has been announced by Construction Machinery Division, Clark Equipment Company, Benton Harbor, Mich.

The new distributor is covering a territory comprised of 37 Texas counties. President and sales manager of the firm is R. J. Withrow.

C. H. READE, president of Reade Manufacturing Company, Jersey City, N. J., has announced the formation of a new company, Thermex Metallurgical, Inc. After a year and a half operation as a division of Reade Manufacturing, Thermex Metallurgical will now carry on, as a separate corporation, the Thermit welding business acquired by Reade from Metal Thermit Corporation in 1957.

Officers of Thermex are L. J. Reade, president; C. F. Reade, executive vice-president; and J. H. Deppeler and W. C. Cuntz, vice-presidents of operations.

STAN FAIN has been appointed manager of advertising and sales promotion for R. G. LeTourneau, Inc., Longview, Texas. He joined the firm three years ago. For nine years prior to that, he was assistant advertising manager for American Air Filter Company.

JAMES A. DRAIN has joined the H. K. Porter, Company, Inc., Pittsburgh, Pa., as a vice-president. For the past 18 years he has been a member of the management group of Joy Manufacturing Company, Pittsburgh, Pa. At Joy, he was most recently vice-president and general manager of the mining and construction division.

JOHN K. O'HARE has been named assistant director of sales for the explosives operations of Olin Mathieson Chemical Corporation, New York, N. Y. He will have offices in the company's East Alton, Ill., plants. Before joining Olin Mathieson, Mr. O'Hare was vice-president of the Hamill Manufacturing Company at Monroeville, Pa.

John K. O'Hare

Robert L. Logan

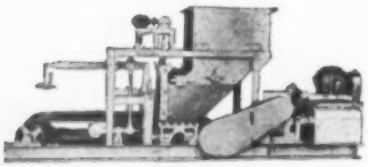
ROBERT L. LOGAN has been appointed Western Zone manager for Daybrook Hydraulic Division, Young Spring & Wire Corporation, Bowling Green, Ohio. Mr. Logan will work with Daybrook truck equipment distributors in the sales and service of the company's products in the States of California, Washington, Oregon, Arizona, Nevada, Utah, and Idaho.

JAMES G. WALKER has been appointed staff manager for Architect, Engineer-Contractors by Johns-Manville Corporation, New York, N. Y. His responsibilities will include servicing large project architects, engineers, and contractors with Johns-Manville products now available for heavy construction.

He will also help co-ordinate specifications and sales efforts on large projects where more than one J-M division or sales district is involved.

The acquisition of the Shawnee Manufacturing Company, Inc., Topeka, Kans., was announced by the Koehring Company, Milwaukee, Wis. Shawnee manufactures backhoes, loaders, brooms, scrapers, rear blades, and other attachments for wheel type utility tractors. The newly acquired company will operate as part of Koehring's Parsons Division of Newton, Iowa, which manufactures trench digging equipment.

HIGH SCALE on the Totem Pole!



. . . for superior performance

The SCHAFFER POIDOMETER

is rated "tops" in scaling efficiency by experienced processors of bulk materials.

The high-speed, high-precision, automatic Poidometer is specially designed and built to promote product uniformity and increase output.

Spot this machine anywhere—it will give unmatched service under all working conditions, and demonstrate record operating economy.

The Poidometer is available with remote control devices for showing and changing feed rate, and with total weight recorders.

WEIGHING
BLENDING
FEEDING
MIXING
RECORDING
PROPORTIONING

OVER 1600 now serving Industry

CATALOG No. 5 has full details

SCHAFFER POIDOMETER CO., 2828 Smallman St., Pittsburgh 22, Pa.

Enter 202 on card, page 177

Need grinding balls in a hurry?

CONTACT UNITED STATES STEEL! If all of a sudden you find you're caught short on grinding balls, you can get them fast from United States Steel. For example, a West Virginia company needed 40,000 pounds of 2½-inch diameter USS Carbon-Manganese Grinding Balls in a hurry. They asked our Baltimore Office if the order could be shipped within two days after it was entered. We came to the aid of our customer and shipped his order *one day* after it was entered.

Though most companies place orders for grinding balls two to three months in advance, there are always emergencies . . . and United States Steel is ready to help you out when that emergency comes up. A complete stock of USS Carbon-Manganese Steel and USS Alloy Steel Grinding Balls is maintained at all times.

We can ship grinding balls almost any way you like: In 100-pound capacity burlap bags; in 2,000-pound capacity steel drums; in semi-trailer or dump trucks; in gondola or box cars (loose or in containers); or you can send your own truck if you like. The next time you need grinding balls contact the United States Steel Sales Office nearest you, or write or call United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

USS

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Export Company

United States Steel

The Harrisburg (Pa.) branch of the Allis-Chalmers Manufacturing Company, Tractor Group, has moved into its new brick building at the junction of U. S. Highway 422 and Pennsylvania State Highway 14 just west of the city.

Allis-Chalmers construction machinery and farm equipment dealers in Pennsylvania, New Jersey, Delaware, and Maryland are served by the Harrisburg Branch. In charge of Tractor Group product distribution from the branch are: Charles E. Webster, farm equipment branch manager; O. N. Olson, construction machinery branch manager, and Edgar J. Blum, engine sales manager.

J. E. CHADWICK has been appointed to head a new department of Koehring Company which will be a part of Koehring's central office marketing activities. Mr. Chadwick, as marketing manager, national accounts, will co-ordinate the relationship between national and fleet users of Koehring products and the sales activities of the ten divisions of the Koehring Company.

C. L. CUMMINS, founder of Cummins Engine Company, Inc., Columbus, Ind., was presented his 40-year service pin recently by R. E. HUTHSTEINER, president. Mr. Cummins retired as honorary chairman and member of the board of directors in 1957. He now resides at Sausalito, Calif.

Appointment of FRANK E. WHYTE to the newly created position of director of purchasing has been annuonced by SKF Industries, Inc., Philadelphia, Pa. In his new post he will direct and coordinate the ball and roller bearing manufacturers purchasing and traffic department activities. Mr. Whyte joined SKF as general purchasing agent in 1957.

JAMES O'MARA was appointed by Galion Allsteel Body Company, Galion, Ohio, to the position of regional sales manager for the northeastern United States. He will headquarter in New Milford, N.J., and represent the company in eleven states.

Hewitt-Robins, Incorporated, Stamford, Conn., has established a new wholly-owned subsidiary in Italy. Other foreign subsidiaries of the company are in Holland, England, Canada, France, and South Africa.

The new unit, Hewitt-Robins (Italia) (S p A), is under the direction of J. J. SHEEHAN, general manager of the International Division. The resident manager of the office will be VINCENT CASTORO, formerly associated with the Hewitt-Robins engineering organization in the U. S. A., and during the last few years head of the company's engineering staff in Amsterdam.

The new office will work in close cooperation with Officine Meccaniche di Savona Servettaz-Basevi, a machinery manufacturing firm in Genoa licensed to produce conveyor machinery of Hewitt-Robins design.

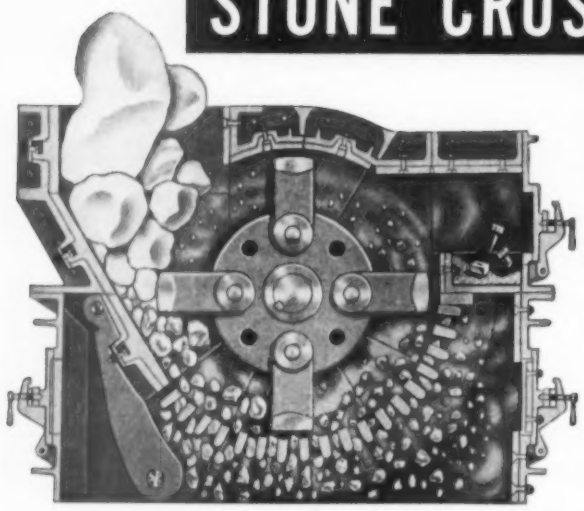
Diamond Power Specialty Corporation, Electronics Division, Lancaster, Ohio, has appointed five firms as sales representatives for Diamond closed circuit television systems.

For the state of Maryland: The Curtis Engine and Equipment Company, Baltimore, Md.; for western Pennsylvania and eastern West Virginia counties: West Penn Controls Company, Pittsburgh, Pa.; for central Ohio counties: The Col-Mer Company, Columbus, Ohio; for central Michigan counties: Fulton Radio Supply Company, Jackson, Mich.; for the State of Washington: New Products, Inc., Seattle, Wash.

Yale Materials Handling Division, The Yale & Towne Manufacturing Company, Philadelphia, Pa., has appointed El Paso Flournoy Company, Inc., El Paso, Tex., as a franchise representative. A southwest industrial supplier for 13 years, El Paso Flournoy will supply Yale industrial lift trucks and tractor shovels to west Texas and southeastern New Mexico.

Heisler's Incorporated, Willard, Ohio, is a new distributor for Highway Equipment Company, Cedar Rapids, Iowa. Heisler's will serve 15 Ohio counties with the *New Leader* products.

American MODEL ACS
STONE CRUSHERS



- Capacities up to 250 tons per hour
- Ruggedly built for extra heavy duty service
- Manganese steel liners, breaker plates, hammers and grate bars
- Wide range of reduction ... low-cost operation

Write today for literature! "Better Stone Crushing"

American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1059 MACKLIND AVE. ST. LOUIS 10, MO.

Enter 204 on card, page 177

Wearpact steel teeth on this bucket last over 8 times longer!

Maybe you don't dig anything as tough as slag—but the experience of The Holmes Construction Company, Wooster, Ohio, can still point the way to savings on *any* dipper tooth application.

They were using so-called wear-resisting teeth on a backhoe bucket... teeth that needed replacement in 1 to 3 days. As a trial, they installed one Wearpact Steel tooth on the bucket... *and it outlasted competitive teeth over 8 to 1!*

An average of over 1 months' service instead of 1 to 3 days... does this suggest a way for you to save money?

Now is the time to find out about longer-wearing, dollar-saving Wearpact... the new high-hardness steel—about 500 Brinell—that's ductile and tough. Write today for complete information!

Cut your costs with WEARPACT®

CAST ALLOY STEEL

A product of

AMERICAN STEEL FOUNDRIES

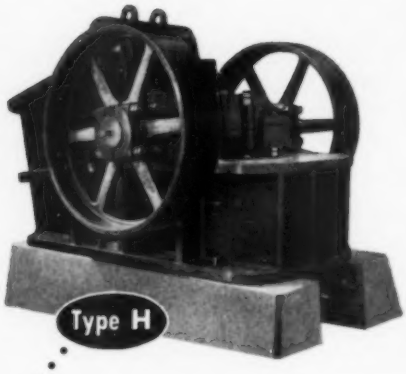
3800 Canal St., Indiana Harbor, Indiana

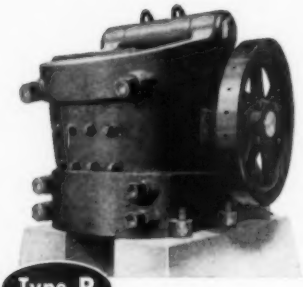
In Canada: International Equipment Company, Ltd.
Montreal 1, Quebec

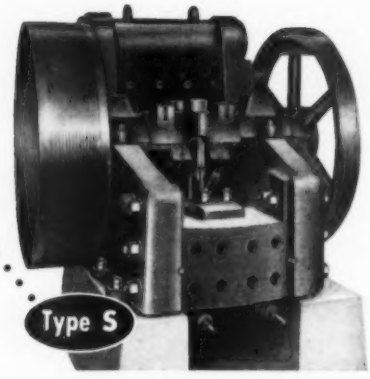
Many operators throughout the world know the economy and rugged dependability of Traylor-Made Jaw Crushers. Over 50 years of experience results in many advantages for the user of these crushers.

Traylor-made Jaw Crushers

Some of the features incorporated in Traylor Jaw Crushers are jaw plates of the Traylor curved type—the pitman shaft is made of annealed open hearth forged steel. The swing jaw is made of cast steel of extra heavy design for maximum strength. For more of the features of Traylor Jaw Crushers, write to Traylor today.







GYRATORY CRUSHERS • JAW CRUSHERS
Traylor
ROTARY KILNS • BALL MILLS • APRON FEEDERS

See the Traylor display
at the CHEM SHOW—Booth No. 495
New York Coliseum
Nov. 30 — Dec. 4

TRAYLOR ENGINEERING & MANUFACTURING COMPANY

1195 MILL ST., ALLENTOWN, PA.

Sales Offices: New York — Chicago — San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P.Q.

CUT YOUR LOADING COSTS WITH NEW 5 Yd. LIMA LOADER

5 MACHINES IN 1! converts in field to shovel, crane, dragline or pullshovel

FLEXIBLE! digs, scoops, swings and loads in full circle

ELIMINATES WASTE MOTION

CUTS WIDE 8-Ft. SWATH

NEW LIMA UNIT GIVES TOP LOADER PRODUCTION WITH SHOVEL EFFICIENCY...
serves as excavator, materials handler

The new Lima Loader, with giant 5-yd. bucket, moves more dirt and materials faster and more profitably.

These are the reasons — long horizontal crowding action; big 5-yd. capacity bucket; full swing versatility; high-speed digging and loading from stationary position.

NO WASTE MOTION

Powerful 9-ft., 10-in. horizontal crowding action assures maximum loading at every 5-yd. bite . . . even when handling wet materials. Bucket is completely filled without moving machine; results in less travel wear, lower maintenance and fuel consumption.

For maximum versatility, the Lima Loader is mounted on basic Lima 64 crawler type machine. It operates at top efficiency, hour after hour, from a stationary position, no time-wasting maneuvering with each load. Unexcelled full-swing digging and loading at any point of the compass means high production . . . higher profits!

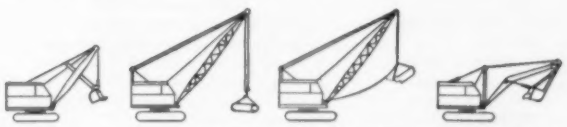
Actually the Lima Loader is 5 machines in 1. It can be speedily converted in the field to a 1¼ or 1½-yd. *shovel*, 40 or 50-ton *crane*, 1¼ or 1½-yd. *pullshovel*, or variable capacity *dragline*.

Other important operational features of the Type 64 Lima Loader include hydraulically controlled bucket which raises to 25-ft., 6-in., permitting 16-ft., 10-in. clear dumping height at 18-ft. radius. The bucket tilts to 52 degrees for complete emptying. 8-ft. wide bucket, with removable teeth, cuts accurately and evenly on sloping banks as well as level ground. Independent travel, optional equipment, but recommended with loader. Torque converter matches power to digging resistance; eliminates engine stalling.

PRECISION AIR-CONTROLLED

The main and auxiliary machinery is precision air-controlled for amazingly easy operation without fatigue.

See your nearest Lima distributor today or write Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio, for full information on the 5-yd. Lima Loader — the newest addition to Lima's famous line of high-quality construction equipment.



Shovels to 6-yd. Cranes to 110-tons Draglines, variable Pullshovels to 2½-yd.

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

5956

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

A BOON TO TRUCK CRANE OWNERS

INCREASE YOUR MOVING CAPACITY in both Short and Long Stick operations UP TO 50% with

ROLLING OUTRIGGERS

TRADE MARK PATENT PENDING

that FIT ALL MAKES AND MODELS OF TRUCK CRANES

- ALLOW NEAR-CAPACITY LOADS TO BE MOVED OVER LEVEL AND RUGGED TERRAIN
- ELIMINATE COSTLY, TIME-CONSUMING PRACTICE OF SETTING AND RE-SETTING OUTRIGGERS AND PADS
- ALLOW GREATER LOAD DISTRIBUTION AND PREVENT OVER-STRESSING CRANE CARRIER
- TANDEM, PIVOTAL ACTION WHEEL ASSEMBLY
- RUGGED CONSTRUCTION
- INSTALLED IN FIVE QUICK MINUTES

One Pair Single Tandem Units, Weight approx. 1360 lbs.
One Pair Double Tandem Units, Weight approx. 2630 lbs.

"ROLLING OUTRIGGERS" INSURE MOBILITY, SAFETY AND INCREASED PROFITS

Manufactured by Lincoln Welding Works, Inc., 1329 So. "A" St., Las Vegas, Nevada

WRITE FOR NAME OF "ROLLING OUTRIGGERS" DEALER IN YOUR AREA

SOME EXCELLENT DEALERSHIPS ARE STILL AVAILABLE

Enter 208-A on card, page 177

COLUMBIA

ARMOUR-TOUGH MANGANESE STEEL

CRUSHER PARTS

are heavier, tougher, where rock meets metal

Don't take our word for it. Order Columbia Armor-Tough crusher parts. Then compare the life and the production with the parts you have been using. Once you *compare*, you, too, will become a Columbia customer. In addition, Columbia offers one of the most complete stocks of crusher replacement parts in America. You're sure of fast delivery from a single source when you rely on Columbia.

WRITE TODAY

For Columbia Brochure #1063, "The Story of Hidden Values".

Smooth Roll Shell

JAWS • TOGGLE BEARINGS
BOWL LINERS • CHEEK PLATES
ROLL SHELLS • CONCAVES
TOGGLES • MANTLES
HAMMERS

Columbia

COLUMBIA STEEL CASTING CO. INC.
933 N. W. JOHNSON, PORTLAND 9, OREGON

Enter 208-C on card, page 177

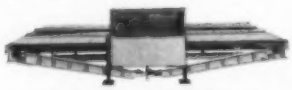
Winslow TRUCK SCALES

PIT AND PITLESS TYPES

CABINET DIAL

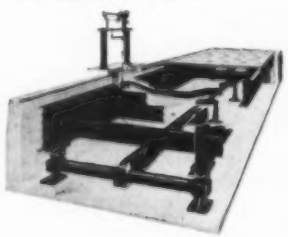
Weight indication available includes ball bearing poise weighbeams, direct reading and weight imprinting types, and dial equipment with or without weight printer.

Write or phone for more information
PHONE NORTH 1231



TYPE CS—PORTABLE—PITLESS

Type CS scales, pitless installation, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 50 tons. Platform sizes 18′ x 9′ thru 40′ x 10′, wood or steel deck.



TYPE S—PIT SCALE

Type S scales, pit installation, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 60 tons. Platform Sizes 22′ x 9′ thru 60′ x 10′ for wood or concrete decks.

WINSLOW GOVERNMENT STANDARD SCALE WORKS, INC.

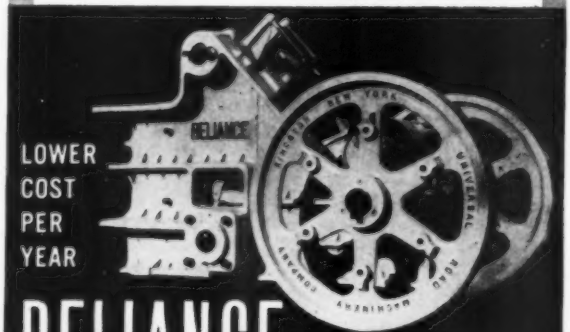
4810 NORTH 25TH ST. TERRE HAUTE, IND.

SCALE MANUFACTURERS FOR OVER A HALF-CENTURY

Enter 208-B on card, page 177

LEVER-TYPE JAW CRUSHER STILL IN USE AFTER 36 YEARS

—at Keystone, So. Dakota



LOWER COST PER YEAR

RELIANCE HEAVY-DUTY CRUSHER

- Heavier, stable—you save money on upkeep.
- Minimum abrasion — outlasts other designs 3 to 1.
- Long jaw plates — adjustable for fineness.
- Crushing, screening and washing plants—50 to 1,500 tons-per-day capacity —engineered to your needs.

Booklet on request, pictures installations.

UNIVERSAL ROAD MACHINERY CO.

Main office and factory: Kingston, N. Y.
New York City office: 117 Liberty St.

Enter 208-D on card, page 177

NOW—Low Cost—High Profit

WITH A

MECKUM-FLOATEX SAND MAKING AND CLASSIFYING SYSTEM

Here is the modern solution to low cost production of specification sands. No more constant manipulation and adjustment to meet tough specs. This marvel of sand production is producing specification sands at greater efficiency and lower costs than you ever realized possible. Once production is started, the sands are automatically classified, blended and stockpiled without labor. Meckum-Floatex Systems available to meet any requirements.

Check these features: removes clay and silt • no loss of fines • controlled uniform classification • negligible wear and maintenance • fully adjustable • maximum efficiency.

If you want the lowest cost sand production available, and the easiest operating plant, investigate how the Meckum-Floatex System can fit your operation.

MECKUM ENGINEERING, INC.

Dayton Road — 53 W. Jackson Blvd.
Ottawa, Illinois — Chicago 4, Illinois

MECKUM ENGINEERING, INC.

Dayton Road
Ottawa, Illinois

Please send me the facts on how the Meckum-Floatex Sand Making & Classifying System can make 'spec' sand at rock bottom cost.

I am interested in a _____TPH system.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

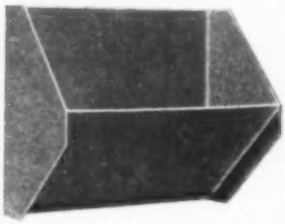
F-3 PQ

TOUGH
CONVEYING and ELEVATING CONDITIONS ?

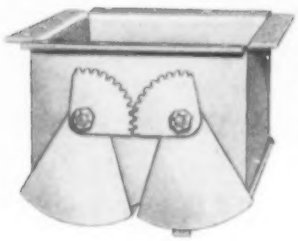
STANDARD METAL'S users lick TOUGH problems Every Day!

STANDARD METAL'S CONTINUOUS ELEVATOR BUCKET STYLE No. 2

This long-life bucket resists wear — delivers outstanding service and economy under severest conditions. This style is just one of the complete line of low-cost, rugged steel buckets manufactured by Standard Metal. Available in Salem, Style "A" and other continuous style buckets.



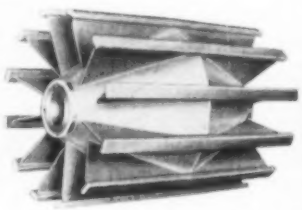
STANDARD METAL'S BIN GATES



Here's the all-steel, gear-operated Duplex Bin Gate for faster, easier material handling at minimum cost. Now supplied standard with twin bracket at bottom of gate, drilled to accommodate bolt for fulcrum lever.

STANDARD METAL'S WING-TYPE SELF-CLEANING PULLEY

Includes Taper-Lock Split Bushing to save time and trouble when mounting shaft. These pulleys are light in weight, yet their all-steel welded construction resists breaking, and delivers many years of trouble-free, low-cost service. Also available with solid hubs bored to specifications.



Contact us for full details and quotations on your particular needs in elevating and conveying equipment—for new installations or replacements. Ask for the catalog showing the complete Standard line.

STANDARD METAL MFG. CO.
110 CENTER ST. MALINTA, OHIO

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SINCE 1885—GRUENDLER QUALITY, BEST MONEY CAN BUY

Gruendler Stationary Quarry Plants

Equipment includes Primary Jaw or Impact Crusher and Apron Feeder,—Conveyor to Screen,—Vibrating or Revolving Screen,—Secondary Rolls, Hammermill or Jaw Crusher,—Return Conveyor to Main Conveyor and Steel Bins for various size aggregates, with all drives and chutes. Gruendler dependable Plants are sturdier in construction with long experience behind them for most economical operation. Complete equipment available for your plant to produce upwards to 3000 tons daily if desired.

Write for our Bulletin: ROCK and GRAVEL OPERATION

GRUENDLER CRUSHER & PULVERIZER CO.
Dept. PQ-959 2915 N. Market St. St. Louis 6, Mo.

Enter 210-B on card, page 177

CONTRACT CORE DRILLING

EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE

FOUNDATION TEST BORING

GROUT HOLE DRILLING

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

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DEPENDABLE FOR 60 YEARS

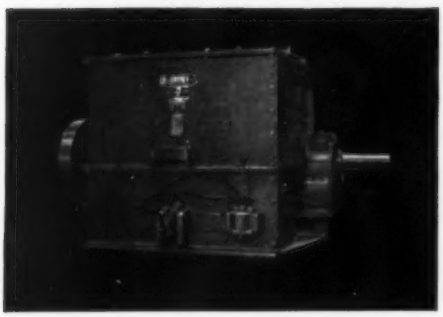
Woven Wire

ALLOY SCREENS

TWIN CITY IRON & WIRE CO.
St. Paul, Minnesota

Enter 210-D on card, page 177

Jeffrey Pulverizer crushes fluxstone fine for efficient sintering



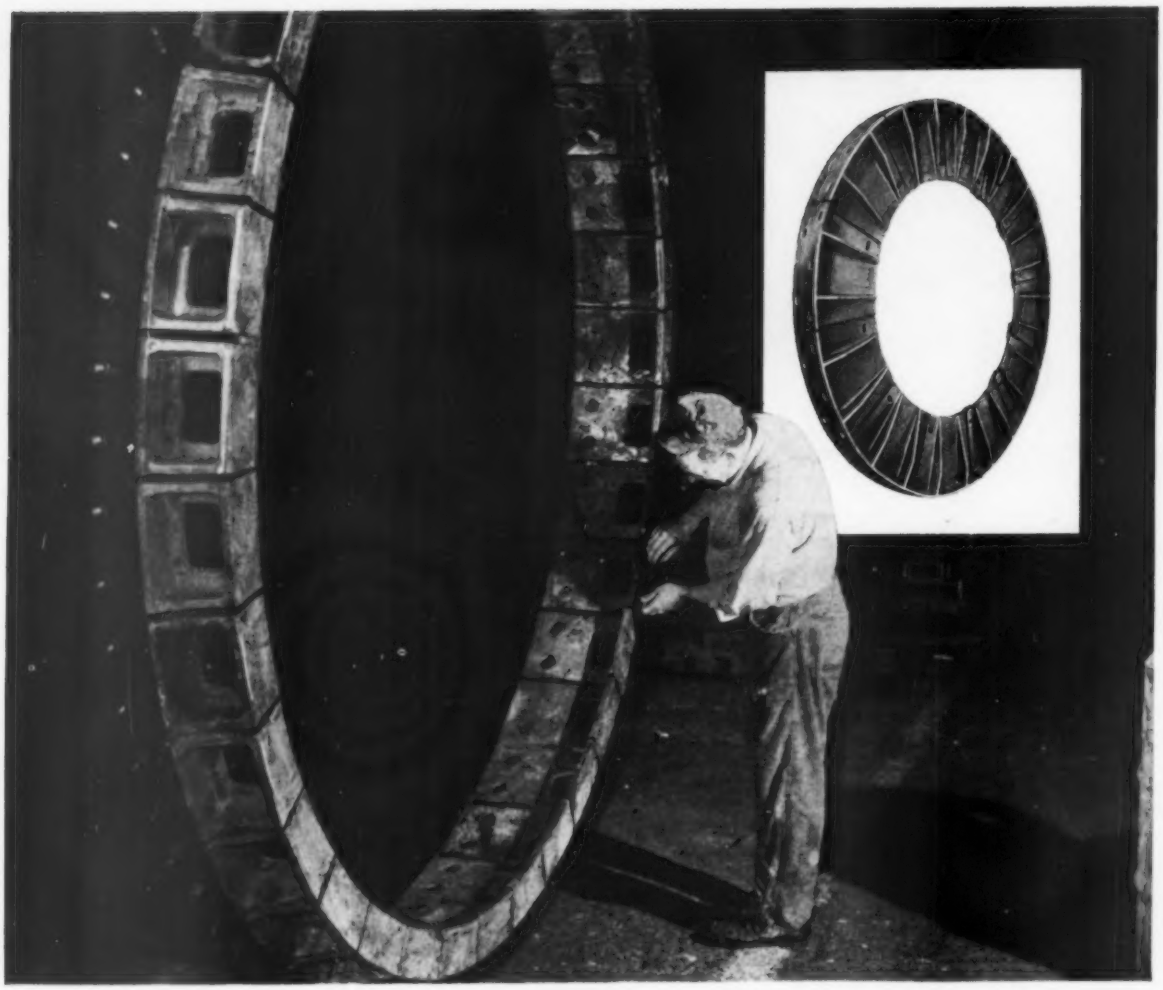
The Jeffrey Type B Pulverizer has many advantages in crushing fluxstone for sintering operations. It crushes *fine* – standard 3/8", or 1/8", when required. This is possible since the material goes through several changes in direction and several hammer contacts before it reaches the screen bars.

This unit is reversible, designed for heavy duty work, is dust-tight, and has hydraulic adjustments. Power requirements are less than with other units, since most of the work on the material is done before the material reaches the screen bars.

Fluxstone is but one of hundreds of materials which can be efficiently reduced with Jeffrey Crushers... from alum and asbestos to rock and slag. For complete information check your nearest Jeffrey sales engineer. The Jeffrey Manufacturing Company, 917 North Fourth Street, Columbus 16, Ohio.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT... TRANSMISSION MACHINERY...CONTRACT MANUFACTURING



IN CEMENT, LIME, AND DOLOMITE PLANTS...

B&W Nose and Tail-Ring Castings Demonstrate Longer Continuous Service

Longer brick life and longer continuous service are being attained by 275 kilns in 54 plants using B&W Nose and Tail-Ring Castings. In many cases, the life of these castings has exceeded 9 years.

Light and strong B&W Alloy Castings have improved kiln performance in most installations. Made of heat-resisting Grade HH alloy, nose ring castings eliminate belling out of the kiln shell, assuring longer brick life and longer continuous operation of the kiln. By protecting the end of the kiln shell from direct flame, the nose ring castings prevent "feathering-down" of the shell because of oxidation. Their design eliminates cracking and warping, experienced with large size castings.

Small size and light weight make B&W Castings easy and inexpensive to install. The protecting flange on the nose ring castings permits the use of low-alloy steel bolts for fastening.

Spare part inventory may be kept low because the same nose ring castings may be used on kilns varying up to 4 feet in diameter, depending upon size. Write for Bulletin S-17. The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

3-467

Six Marions Work Here

This 93-M 2½ yard shovel is one of six Marions which keep the rock rolling at a Pennsylvania cement plant.

Another 93-M, three Marion electric shovels built nearly 35 years ago and a Marion 362 diesel dropball complete the Marion equipment team at this busy operation producing in excess of a million tons a year.

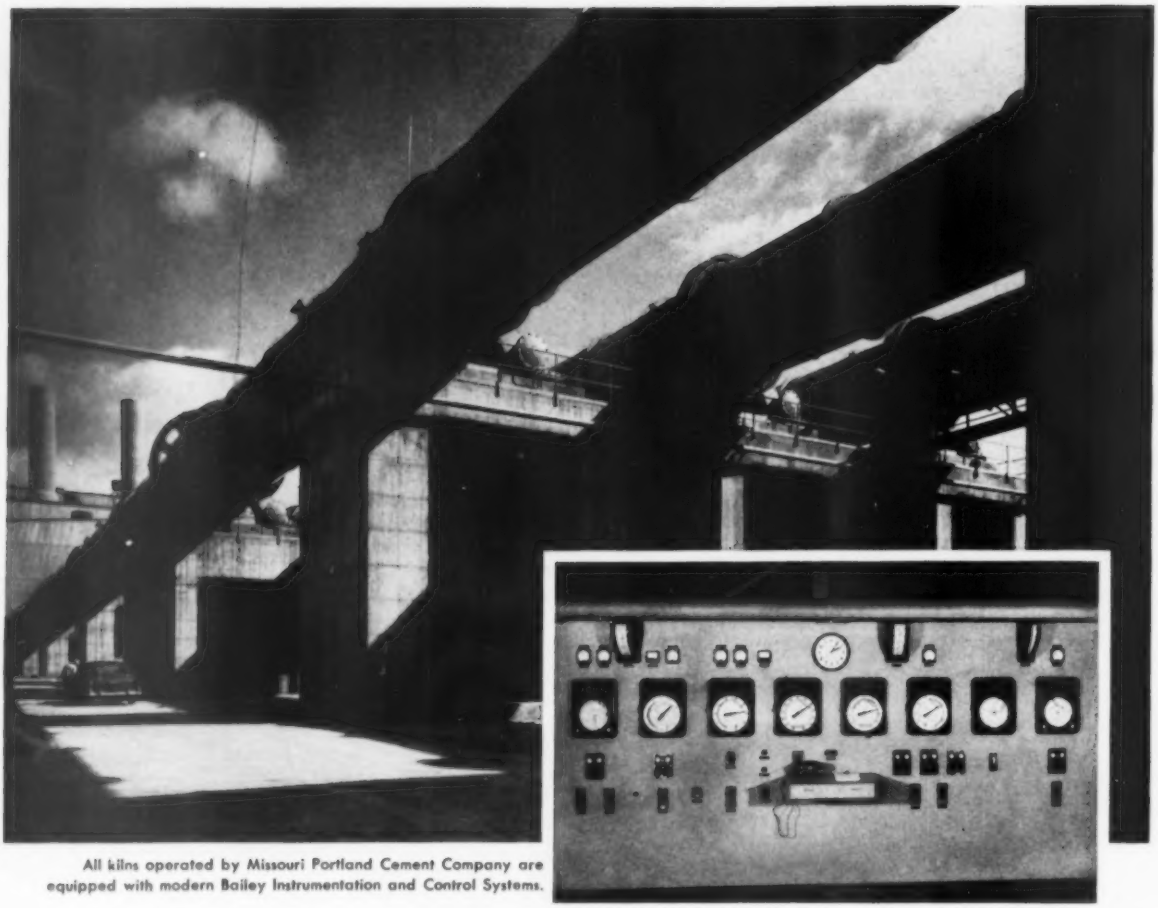
The reasons why Marion is preferred equipment in many quarries, large and small, in many parts of the world deserve your investigation. Get the facts on today's Marion quarry machines - - today. Modern Marion electric quarry machines are available in sizes from 2½ to 10 yards.

CONSULT MARION MINING SPECIALISTS

for lowest costs on your property!

MARION POWER SHOVEL COMPANY - MARION, OHIO, U.S.A.

A Division of Universal Marion Corporation



All kilns operated by Missouri Portland Cement Company are equipped with modern Bailey Instrumentation and Control Systems.

How to control the digestion of giant kilns

These giant kilns have delicate stomachs. But the Missouri Portland Cement Company knows how to coddle them to get maximum capacity, uniform product and low fuel rate.

They do it with a Bailey Control System with a central Control Panel where a single attendant has complete control of the variables of combustion and heating.

Because the system keeps continuous chart records, the Burner can check the reading and trend of Kiln Speed, Exit Gas Temperature, % Oxygen in Exit Gas, % Combustibles in Exit Gas, Kiln Shell Temperature, Hood Draft, Temperature of Secondary Air Leaving Cooler, Temperature of Coal-Air Mixture from Coal Mill, Fuel Gas Flow, Feed End Draft, Kiln Speed, Cooler Speed, Cooler Fan Discharge Pressure, Cooler Undergrate Pressure, Cooler Air Flow, Coal Mill Primary Air Pressure, Coal Mill Exhauster Fan Suction, and Fuel Gas Flow.

The system works so dependably that week-long kiln runs have been made without the operator touching anything.

Let a Bailey Engineer help you plan for peak performance! For additional information write for a Bailey Kiln Control Folder. C-14

BAILEY METER COMPANY

1051 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada—Bailey Meter Company Limited, Montreal

10 Design Refinements *Bring You Lower-Cost Crushing with* **BIRDSBORO-BUCHANAN**

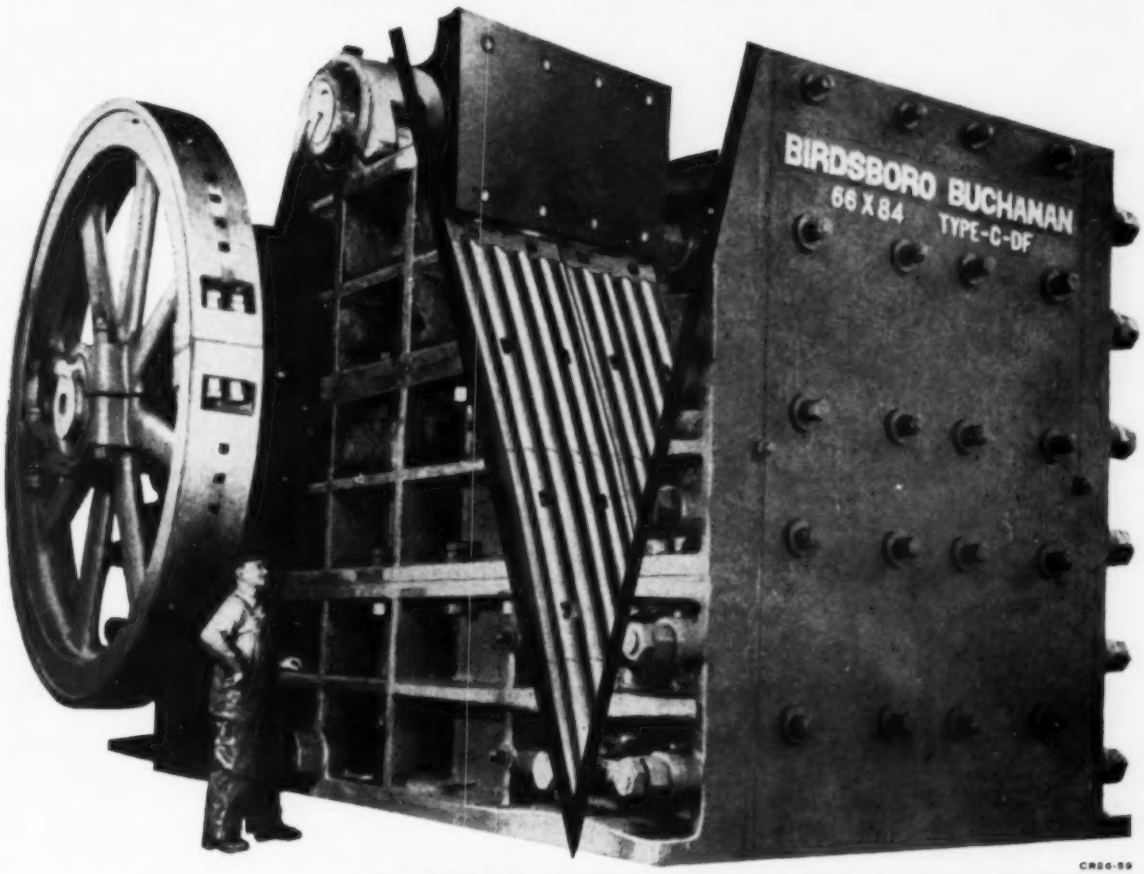
Rugged, powerful BIRDSBORO-Buchanan Deep-Frame Jaw Crushers can deliver the answer to higher costs today . . . higher production. There are ten reasons. You won't find such a cost-cutting combination anywhere but under the BIRDSBORO-Buchanan trademark.

1. **Deep, extra strong cast steel frames.**
2. **Longer, swing jaw for more acute crushing angle.**
3. **New, removable water-jacketed main frame bearings.**
4. **Rod type pitman, lighter and stronger, cuts power costs.**
5. **Automatic lubrication force feed to every bearing—no shut-down for grease jobs required.**
6. **New three-piece toggles cut replacement costs.**
7. **Extra large forged steel shafts for maximum bearing area.**
8. **Offset toe lugs allow extra wear on jaw plates.**
9. **Interchangeable and reversible jaw plates for additional wear.**
10. **Entire crusher precision constructed for easy field assembly.**

Your Birdsboro representative can translate these features into specific benefits for your operation. *Sales Department, Engineering Department and Mfg. Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

Canadian Representative & Manufacturer: John Inglis Co., Ltd., Toronto, Canada.

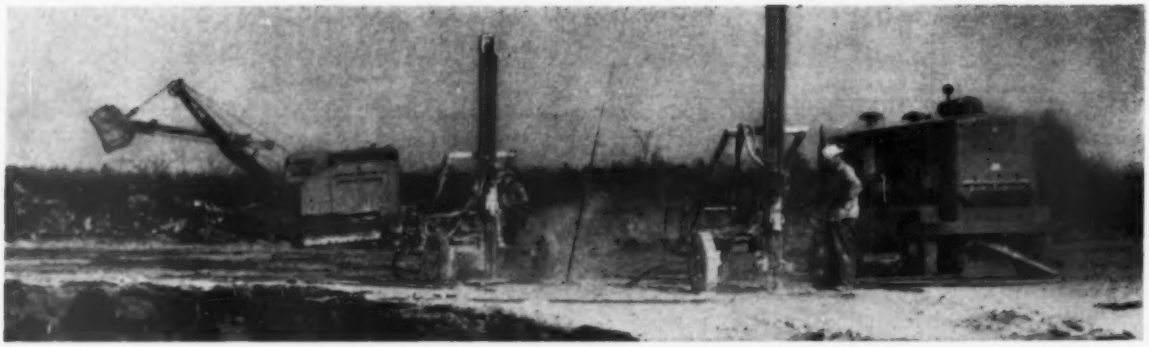
World-Wide Agent Representation. Contact home office for nearest representative.



CR26-59

BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



Logging 500′ per shift in limestone with low cost Jaeger air.

Jaeger "600" and dual drill rig, both truck mounted, handle several locations.

Track drills and readily truck mounted Jaeger rotaries make mobile "teams."

Only Jaeger gives you 600 cfm @ 1700 rpm

Using the same GM 6-71 diesel engine as all other "600" rotaries, your Jaeger gives you full rated capacity at 100 rpm slower speed (1700 instead of 1800). In 8 hours full load operation that totals 48,000 fewer revolutions, saving miles of engine piston travel and pounds of fuel.

Because all operation is below the continuous horsepower curve, engine maintenance is at a minimum. As for the compressor unit itself, many Jaeger rotaries have logged more than 8000 hours without requiring the replacement of a single vane.

125, 250 and 365 cfm models are comparable (1700 rpm full load speed instead of 1800 up). The difference puts money in your pocket. Ask any Jaeger user — or ask us for Catalog JC-7.

THE JAEGER MACHINE COMPANY

602 Dublin Avenue, Columbus 16, Ohio

Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario

Hard Surfacing Semi-Automatically with WEAR-O-MATIC Yields Big Production Dividends for Custom Shop

The 5½ yard bucket shown above is being built up with Wear-O-Matic Nickel Manganese. This is a vertical weld on one of the grizzlies in the bucket. Over this will be deposited one pass of Wear-O-Matic 15. Perry Westlake has cut in half the time required on a job like this by using the Wear-O-Matic process.

Perry Westlake, Owner, Westlake Service, Burgettstown, Pennsylvania, does his best work while other men sleep. His custom hard surfacing of equipment must be done between shut down time at night and start up time next morning. This rigorous schedule has been the downfall of many contract weldors. Westlake solved this problem with the new Wear-O-Matic Semi-Automatic Hard Surfacing Process. "It would take an additional gasoline driven DC welding machine and another trained hard surfacing weldor to turn out the production we now get using the Wear-O-Matic process," says Perry.

Easier, continuous welding at faster speeds; quicker set up time per job; simpler wire change over and longer wearing alloy deposits have increased the efficiency of Westlake's entire operation.

A complete range of build-up and hard surfacing alloys packed in convenient 100 pound Payoffpaks provides longer wearing deposits for all hard surfacing requirements. The low initial cost of the Wear-O-Matic process makes the change over to semi-automatic hard surfacing feasible for every maintenance shop.

Your weldors will like the ease and convenience of the Wear-O-Matic process and you'll like the increased production. Write for Bulletin HS-132, Alloy Rods Company, P. O. Box 1828, York, Penna.

Alloy Rods Company

YORK, PENNSYLVANIA • EL SEGUNDO, CALIFORNIA

WHICH FILTER BAG FABRIC FITS YOUR NEEDS?

Why not ask one of the largest manufacturers of industrial textiles? Albany Felt Company can furnish any fiber, in any fabric — and thus is in a position to make a *completely impartial* recommendation.

Your inquiry is invited. No obligation, of course.

ALBANY FELT COMPANY
INDUSTRIAL FABRICS DIVISION
MAIN OFFICE AND PLANT: ALBANY 1, N. Y.

ATTACH THIS COUPON TO YOUR LETTERHEAD — MAIL IT TODAY

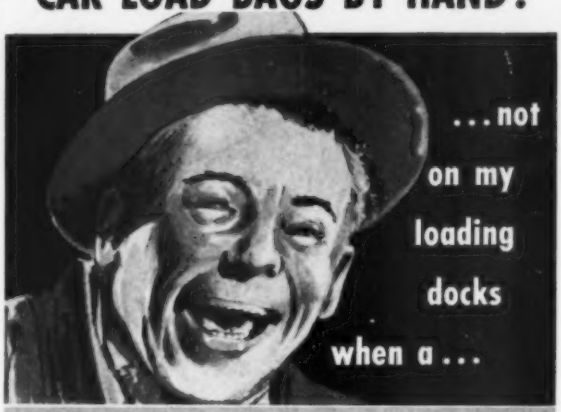
ALBANY FELT COMPANY
INDUSTRIAL FABRICS DIVISION
ALBANY 1, N. Y.

☐ Please send us your latest Filter Bag bulletin.

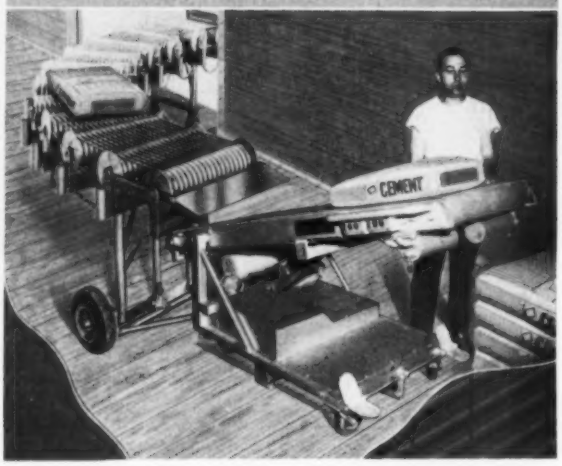
☐ Have your representative call to supply us with a free, scientific analysis of our filter fabric requirements.

Enter 218-A on card, page 177

CAR LOAD BAGS BY HAND?



POWER-CURVE automatic installation will show me a healthy saving in *just one season!*



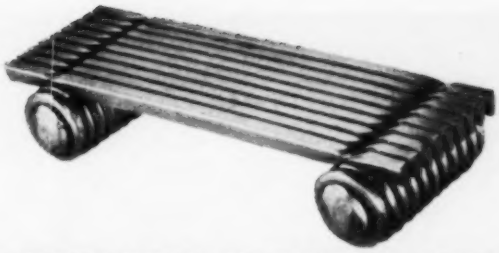
POWER-CURVE makes a quick payout on cement, loading without physical lifting, without interruption and *with just one man* . . . replaces a steady parade of hand trucks and labor. POWER-CURVE will flatten filled bags, route them to storage or to the dock, fill box cars or trucks from end-to-end and to full height neatly stacked against transit damage. POWER-CURVE can transfer, elevate, sort and select. It can unload, convey mixed loads, palletize and economize! It is used by virtually every major cement company in one or more plants. It is self-powered, mobile, fully flexible and variable in height . . . Write for information tailored to your requirements, no obligation.

TEN TYPICAL POWER-CURVE USERS

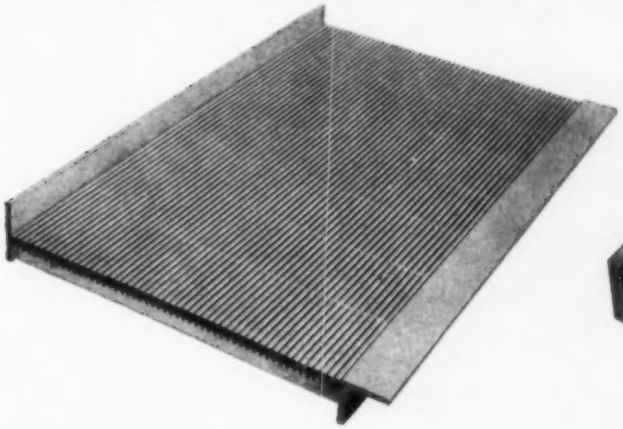
Alpha-Portland Cement Co.	Penn-Dixie Cement Corp.
Lone Star Cement Corp.	Standard Lime and Cement Co.
North American Cement Corp.	Universal Atlas Cement Co.
General Portland Cement Co.	Whitehall Cement Mfg. Co.
Louisville Cement Co.	Dewey Portland Cement Co.

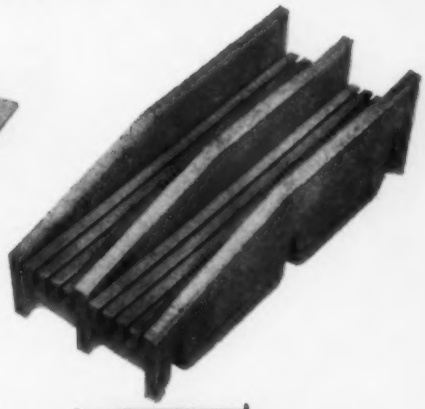
POWER-CURVE
CONVEYOR COMPANY
2185 SOUTH JASON ST., DENVER 23, COLORADO

Enter 218-B on card, page 177



GET 5 IMPORTANT BENEFITS IN THESE HENDRICK SCREENS





1 REDUCED CLOGGING AND BLINDING

2 PRODUCT UNIFORMITY

3 FASTER PROCESSING

4 REDUCED WEAR FROM ABRASION

5 FABRICATION TO FIT YOUR OPERATING CONDITIONS

Perforated Plate with Hendrick H Quality Steel

Full clearance in Hendrick Perforated Plate practically eliminates blinding, permits faster processing. Uniformity of mesh provides product uniformity. Heat-treated H Quality high-carbon steel resists abrasion and screen damage.

Wedge Wire

Free clearance in Wedge Wire reduces chances of clogging and blinding. Tapered profile bar provides maximum water flow, increases dewatering efficiency. Deep profile bar stands up under extra-heavy loads, lengthens service life. Riffle tops are available for operating conditions involving highly abrasive materials.

Wedge Slot Screens

Accurately spaced, uninterrupted slots permit faster processing and dewatering, reduce chances of blinding. For product uniformity, parallel head flanges maintain uniformity of openings. For resistance to abrasion, Wedge Slot is available with Skid Bars that protect the screen against large chunks. Hendrick will gladly help you select, from 8 profile bars, the type that will stand up best under your operating conditions.

Hendrick

MANUFACTURING COMPANY

Headquarters for All Your Screening Needs

39 DUNDAFF STREET, CARBONDALE, PA.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring—Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

Hendrick Manufacturing Co.
39 Dundaff Street, Carbondale, Pa.

Please send me your catalog on:

- ☐ H Quality Steel Perforated Plate
- ☐ Wedge Slot Screens
- ☐ Wedge Wire
- ☐ I would appreciate a call from a Hendrick Sales Engineer.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

Quaker Thermoid THUNDERBIRD...

the toughest (yet most flexible) air hose you've ever used

Give Thermoid-Quaker THUNDERBIRD Wire-Braid Hose the works . . . the roughest kind of impact, twisting, crushing, inside pressures. It'll take everything you can deal out, and then some.

THUNDERBIRD takes this punishment while remaining the most flexible, non-kinking air hose you've set eyes upon. Accurately-controlled angle of wire braid assures this extreme flexibility. Tough neoprene tube resists hot or cold oil. Yellow neoprene cover provides maximum abrasion-resistance and high visibility even in the dark.

Sizes from ⅜" to 4" I.D. Working pressures to 400 psi air or 2,000 psi water. Lengths to 50 feet. Ask your Thermoid distributor about THUNDERBIRD, or write *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Sts., Phila. 24, Pa.*

THERMOID DIVISION PORTER H. K. PORTER COMPANY, INC.

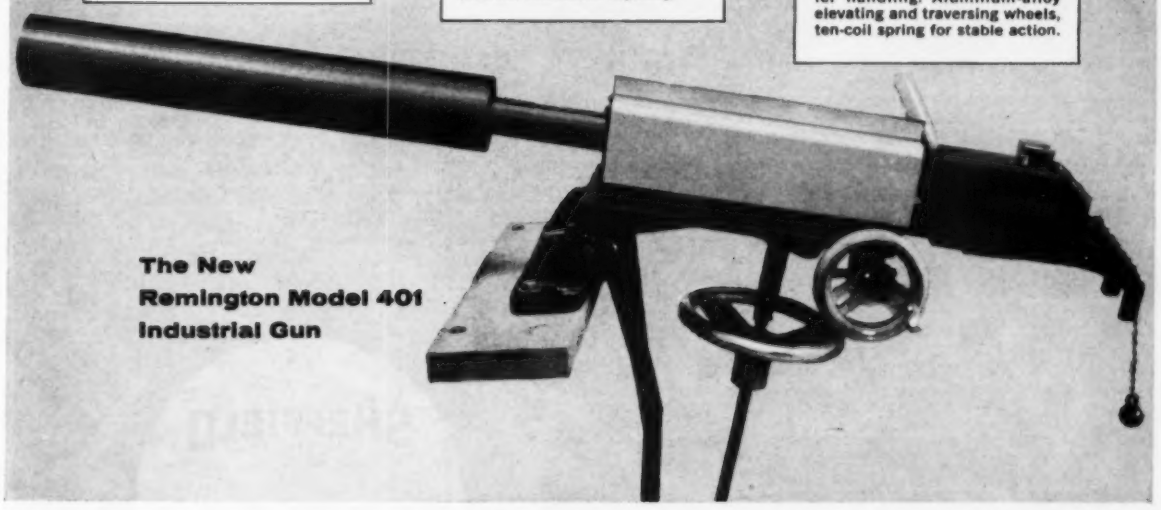
PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD

New— Remington Industrial Gun
offers you these operating advantages—

NEW Built-in Muffler... reduces firing noise up to 50%. Strong, one-piece welded construction. Removable.

NEW Stellite-Lined Barrel... gives constant energy to slug, improves ejection, and gives longer barrel life. Breech design permits full-barrel sighting.

NEW Lighter Construction and Recoil Action... makes for easier handling. Aluminum-alloy elevating and traversing wheels, ten-coil spring for stable action.



The New Remington Model 401 Industrial Gun

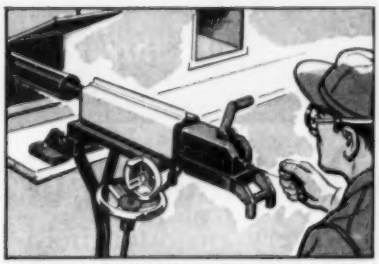
Remove clinker rings in minutes ... save time and money!

You save valuable kiln downtime and man-hours in removing clinker rings with the new hard-hitting Remington Model 401 Industrial Gun. It's designed for use in rotary kilns for cement and lime manufacture, refractories and lime-sludge operations. This newly designed gun does the work of many sledge hammers—brings rings and other troublesome kiln formations down in minutes!

No need to wait until the kiln cools off. In fact, there's no need to turn off flame or stop rotation until ready to fire. To operate, just load—aim—FIRE—and up to 9,000 ft.-lbs. of knockdown power smashes into the clinker buildup. A few well-placed shots, and rotation of the kiln will cause the ring to crumble. Then you're back on a full-time schedule!

Here's the easy, cost-saving way to remove buildups in clinker rings—without damage to kiln or lining. The new Remington Industrial Gun and one man can save you money.

For information about the advantages of this new gun and how it will help solve your problems, write to the address below.



ONE-MAN OPERATION is made more practical by the special construction of the new Remington Industrial Gun. Spade grip and special corrugated operating handle reduce strain for the operator. Safety features include provision for a protective shield which can be fitted to kiln opening to block heat and clinker fragments. Mortised breech block makes it impossible to fire when breech is not fully closed.

3 REMINGTON INDUSTRIAL SHELLS
for variety of power...

Magnum Shell—3-oz. special lead-alloy slug—delivers 9,000 ft.-lbs. of energy.

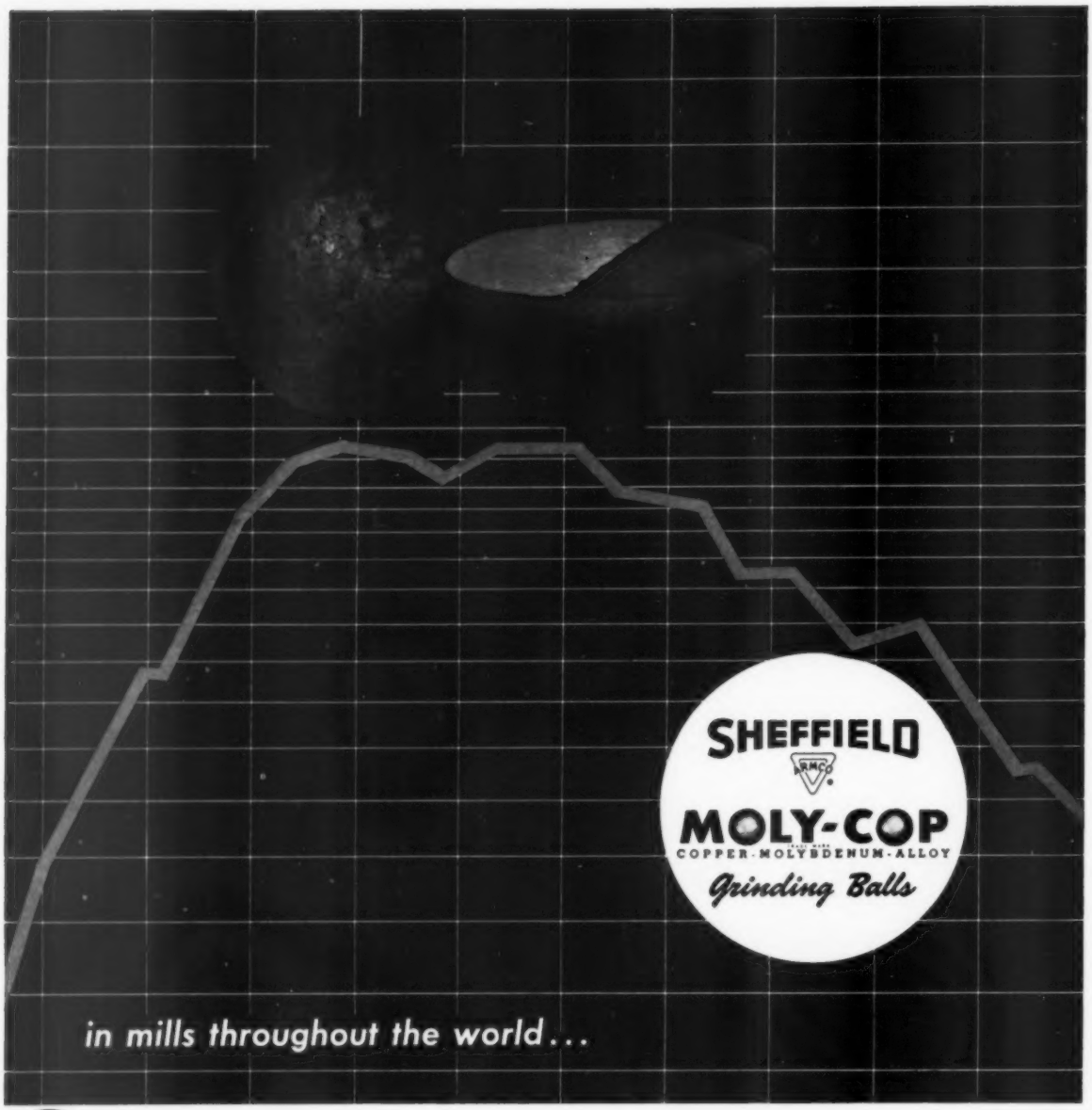
Standard Shell—3-oz. lead slug—delivers 7,500 ft.-lbs. of energy for shorter kilns.

Special Shell—2-oz. special zinc-alloy slug—delivers 7,500 ft.-lbs. of energy.

All shells now available in new easier-to-handle packing

Remington DUPONT

Remington Arms Company, Inc., Bridgeport 2, Connecticut



The Standard of Comparison for PEAK PERFORMANCE

In every product field there's an acknowledged leader—the standard of comparison against which all others are measured. In grinding balls, that standard of quality is Sheffield Moly-Cop. The reason: in performance tests by mill after mill, Moly-Cops give longer service, less down-time, and other production economies.

New steels are born at Armco

SHEFFIELD DIVISION

ARMCO STEEL CORPORATION

OTHER DIVISIONS AND SUBSIDIARIES: Armco Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

BEMIS EXTENSIBLE MULTIWALLS...*THAT'S WHY!*

During the past twelve months,* Bemis has delivered more multiwall bags to the cement industry than in any similar period in its history.

*Period ended June 30, 1959

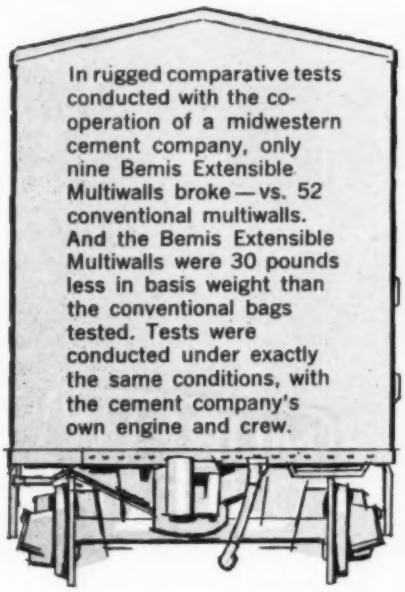
why?...BEMIS EXTENSIBLE MULTIWALLS!

And during this same period, cement plant management and packhouse crews, traffic men and building materials dealers, have noticed reduced bag breakage all along the line.

why?...again, BEMIS EXTENSIBLE MULTIWALLS

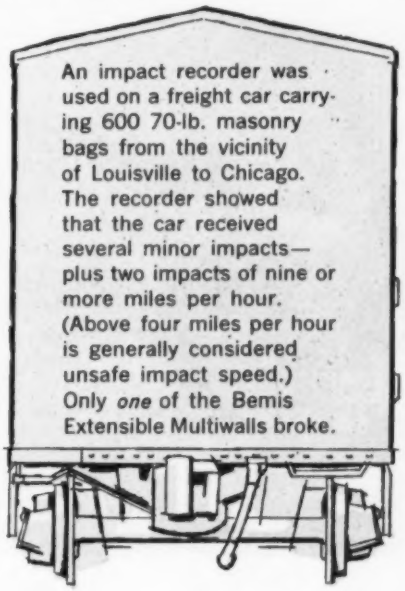
These bags, made of revolutionary "stretch" multiwall kraft paper with traditional Bemis skill, have performed amazingly well.

for example:



In rugged comparative tests conducted with the co-operation of a midwestern cement company, only nine Bemis Extensible Multiwalls broke—vs. 52 conventional multiwalls. And the Bemis Extensible Multiwalls were 30 pounds less in basis weight than the conventional bags tested. Tests were conducted under exactly the same conditions, with the cement company's own engine and crew.

another case:



An impact recorder was used on a freight car carrying 600 70-lb. masonry bags from the vicinity of Louisville to Chicago. The recorder showed that the car received several minor impacts—plus two impacts of nine or more miles per hour. (Above four miles per hour is generally considered unsafe impact speed.) Only *one* of the Bemis Extensible Multiwalls broke.

and in tests . . .

covering actual shipments made over a period of six months with the cooperation of nine eastern cement companies, Extensible Multiwalls outperformed conventional multiwalls by a substantial margin, even though they were from 11.7 per cent to 16.6 per cent less in basis weight.

If you haven't tested these rugged bags in your plant, call your Bemis man today.

why?

BEMIS EXTENSIBLE MULTIWALLS

—your best package for cement and related products

BEMIS

Where flexible packaging ideas are born

GENERAL OFFICES • 408 PINE STREET • ST. LOUIS 2

PORTER BROWN LIMESTONE COMPANY—

100% MURPHY DIESEL

Plant at Springfield, Tenn. . . . . 100% MURPHY POWERED

Plant at Oneonta, Alabama . . . . . 100% MURPHY POWERED

Owner Porter Brown and Superintendent William Boring . . 100% SOLD ON MURPHY DIESEL

Here's why Porter Brown Limestone Company, of Springfield, Tenn., *specifies* Murphy Diesel power when they buy crushing equipment—

"In view of Murphy's good service at our other plants, we specified Murphy power when we bought equipment for our Oneonta plant. Murphys are satisfactory in every way . . . especially for low operating costs and less maintenance. We're sold 100% on Murphy Diesel."

Porter Brown's plant at Oneonta (shown below) is averaging 1500 tons per day of $1\frac{1}{4}$" minus limestone. A 161 HP (continuous) Murphy Diesel powers the jaw crusher and vibrating grizzly in the portable primary, another 161 HP Murphy powers the cone crusher intermediate scalping unit, while a 107 KW Murphy Diesel-Electric Generator Set meets the electrical requirements of the plant.

Aggregate producers and contractors throughout the country are swinging to dependable, economical Murphy Diesels for both portable and stationary plant operations.

Your nearby Murphy Diesel Dealer will gladly help you "power for profit" with the size and type of Murphy Diesel you need.

For stationary installations, Murphy's steady, uniform power and low fuel costs assure efficient power for crushers, screens, conveyors, washing equipment, etc. And don't overlook the economy advantages of Murphy Diesels for generators, pumps, compressors, or for powering or re-powering shovels. 408RO

MURPHY DIESEL

HEAVY-DUTY POWER for Rock

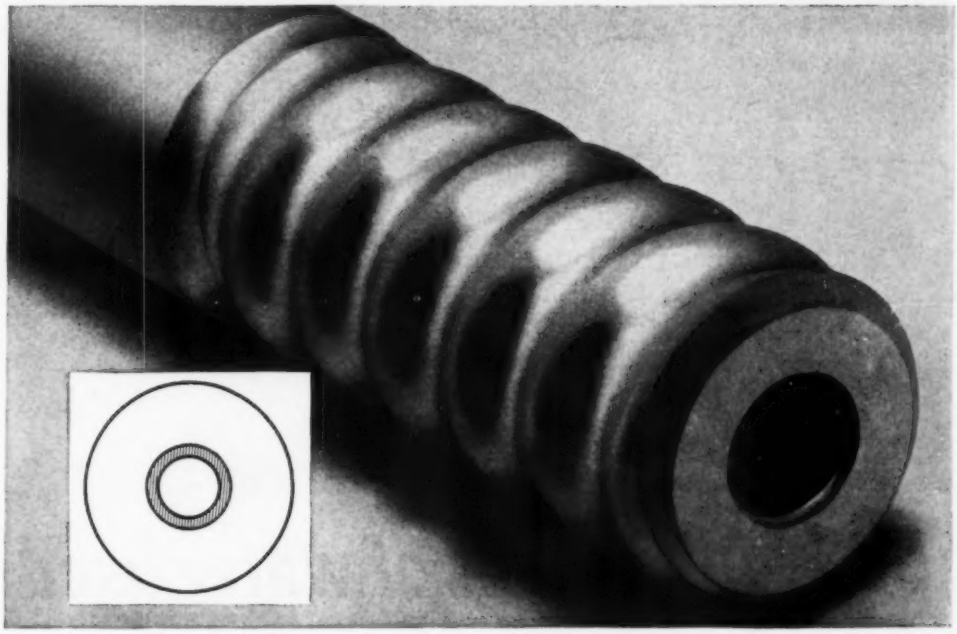
Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY

5307 W. Burnham St. • Milwaukee 14, Wis.

SALES—PARTS—SERVICE throughout the Nation

NEW ROPE THREAD MAKES UNCOUPLING EASY WITH SANDVIK COROMANT EXTENSION STEELS



Rope-Type Threads Afford No Starting Points for Fractures

Connections used in extension drill-steel must be easy to assemble and uncouple, and connections must not become weak links during the actual drilling. Sandvik Coromant's new patented rope thread makes it easy to join and uncouple the equipment . . . yet gives a solid and positive connection. The gently rounded form of this thread means trouble-free performance—eliminates common thread and coupling failures found in "saw-tooth" threads. The complete equipment—bit, rod, coupling sleeve and shank adapter—are all dependable Sandvik Coromant parts made of world-renowned Sandvik alloy steel. A further advantage to the user is that the steel can be re-threaded. Atlas Copco has special literature on Sandvik Coromant extension steel and long-hole drilling, available to you with no obligation. We suggest you write tday!

Atlas Copco

610 Industrial Ave.
Paramus, New Jersey

930 Brittan Ave.
San Carlos, Calif.

Distributors of COMPRESSORS, ROCK DRILLS, PNEUMATIC EQUIPMENT, SANDVIK COROMANT DRILL STEEL and CARBIDE BITS

Enter 225 on card, page 177

540,000 gallons of water used daily by sand and gravel plant!

MARLOW supplies water to meet full requirements

To supply water for their Pioneer and Simplicity washing and screening plant, the Nello L. Teer Company, Erwin, N. C., uses a Marlow 6G3S pump powered by an International-Harvester engine. The pump, located on the bank of a river, carries the water up a steep hill to the plant, a half mile away. On continuous operation, the pump delivers 54,000 gallons per hour, but *can* handle up to 66,000 gallons per hour during peak periods!

Fred Byrd, Superintendent of Operations for the Teer Company, said that the plant has a capacity of 1,400 tons per 10 hour day and uses 540,000 gallons of water. The plant produces sand and gravel up to 1¼ inches in diameter and is used on their own construction jobs as well as sold commercially to other construction firms. Serving the washing and screening plant is an Eagle Screw, Barber Green Conveyor Belts and a Telsmith Gravel Crusher.

Mr. Byrd is well pleased with the performance of his Marlow pump. He says it runs 10 hours a day without interruptions and gives him all the water he needs to meet his requirements.

Let Marlow help you solve your pumping problem. Write today for information on the complete line of A.G.C. rated pumps and famous Marlow Mud Hogs for handling muddy and trash-laden water. Ask for Bulletin CO-4 and the name of your nearest Marlow dealer.

Marlow PUMPS

DIVISION OF

BELL & GOSSETT CO.

Midland Park, New Jersey

Longview, Texas ● Morton Grove, Illinois

7-294

When you're talking about a $162,000 dipper shovel, you've got to talk about the best rope for it

Talking about or working with, the same thing applies. Anything below Royal Blue's performance level is simply unrealistic. Like looking for a cut-price brain surgeon.

Even at $162,000, the cost of wire rope is important. That's why so-so ropes can cost you more in the long run, because so-so ropes are *short run*. Royal Blue, on the other hand, is built by America's oldest manufacturer of wire rope to last, to do the job without a whimper. Here's why.

Royal Blue is made from the toughest rope wire ever made—Type 1105—extra high-strength improved plow steel. This pedigree gives to the rope qualities that you can't find in any other rope: exceptional resistance to shock, abrasion, fatigue and impact. Add to these a flexibility that age cannot wither nor hustling fade and you've got a collection of characteristics that make Royal Blue the strongest rope you've ever used.

A $162,000 Dipper Shovel deserves the best and your Roebling Distributor has it . . . Royal Blue. Any inquiries about this high-born rope will be answered immediately by Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation

RAYMOND Whizzer SEPARATION

CONTROLS THE QUALITY OF YOUR PRODUCTS

RAYMOND
Double Whizzer
Mechanical
Air Separator

Built in ten sizes
up to 18' diameter

THE Raymond Mechanical Air Separator with its efficient Whizzer action offers special advantages in classifying powdered materials for the non-metallic industries. It has three general types of application covering a wide range of products.

(a) In closed circuit with a grinding unit for increasing fineness and mill capacity.

(b) In open circuit operation for removing a coarse fraction to deliver a uniformly fine product.

(c) In open circuit for dedusting operations to remove objectionable fines in making granular products.

The Whizzer principle gives sharper separation with a greater percentage of recovery of fines, and also provides a wide classification range up to 99.9% minus 400-mesh materials.

Raymond Separators may be provided with an internal air distribution system for handling special materials, which require some cooling or drying. For classifying abrasive materials, additional liners are furnished.

For improvement of your products, specify the Raymond Whizzer Separator for classifying lime, gypsum, cement, plaster products, chemicals, fillers and fertilizers.

Laboratory Separator for classifying small batches in test work

For further details, write for Raymond Separator Bulletin #76

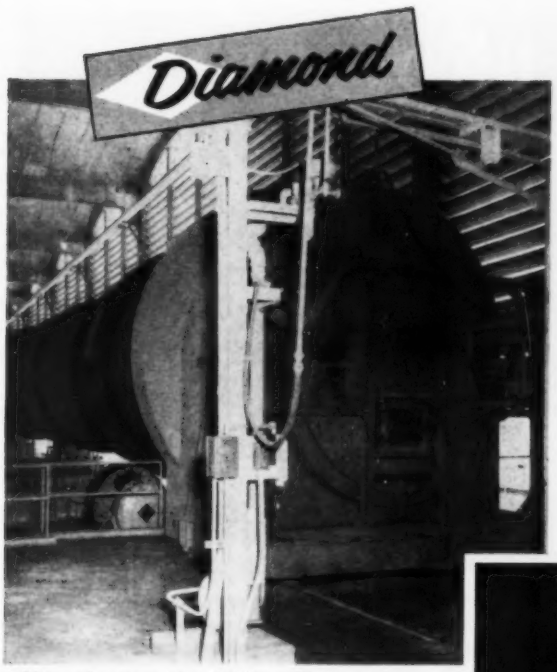
COMBUSTION ENGINEERING, INC.

1122 W. Blackhawk Street
CHICAGO 22, ILLINOIS

Raymond Division

SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada



▲ View of cement kiln. "Utiliscope" Camera may be seen at right side.

▲ Close-up of "Utiliscope" Camera watching interior of kiln. Air cooled "Utiliport" protects lens against high temperature.

▼ Control Room. Operator sees kiln interior on TV monitor.

Modern Cement Plants Produce

MORE UNIFORM CEMENT CLINKER with DIAMOND "UTILISCOPE" TELEVISION

Camera Operates Efficiently in High Temperature Area . . . Provides Economy and Better Plant Layout

Close observation of the interior of the kiln is important in production of uniform high quality cement clinker. But to station an operator at an observation port on each kiln is inefficient use of man power. Also placing the instruments and controls in that location hinders good plant layout.

This problem was solved in this plant with a "Utiliscope", Diamond heavy duty Television System. A camera was installed on each of the two kilns to "see" the interior. Monitors in the air conditioned control room enable the operator to keep close watch on the burning conditions. He can continually check on the formation of clinker. Instruments and controls are also grouped in this room, so he can make immediate corrections when they are needed.

High ambient temperature (up to 2100°F at the viewing port) was no serious problem. The Diamond air cooled "Utiliport" provides adequate protection to the camera lens. The "Utiliscope" camera, which is built for tough conditions, is air cooled in this installation.

Diamond Heavy Duty Television is built to stand severe service. High temperature, dust, dirt, vibration, etc. do not impair its dependable operation.

This is only one of many ways in which the Diamond "Utiliscope" can save money, improve operation, and help produce a better product. It has been proved in a wide variety of plants and applications.

Explore the possibilities of "Utiliscope" for *your* plant. Write us for more information.

DIAMOND POWER SPECIALTY CORP.

LANCASTER, OHIO *Diamond Specialty Limited, Windsor, Ontario*

6297

TRY US FOR SIZE AND TREAD

World's Widest Range of Sizes and Tread Designs!

Whether you operate light or heavy equipment, no matter what your particular job requirements are, Southern Tire can supply the size and tread design best suited to your needs. Modern 3-sectional, interchangeable-tread molds retread any tire—regardless of growth—without buffing to the breaker strips. Lugs of all Southern Tire retreads have as much rubber as a new tire and more undertread than any rock service tire. For careful, experienced workmanship and fast pickup and delivery *at your job site after work hours*, you can depend on Southern Tire every time.

You Get New Tire Mileage at Approximately Half the Cost!

Always Deal With an Independent — Pioneers of the industry . . . Perfectors of Modern Retreading Methods.

SOUTHERN TIRE COMPANY
1414 Broadway
SHEFFIELD, ALA.
Phone Collect
EV 3-2312

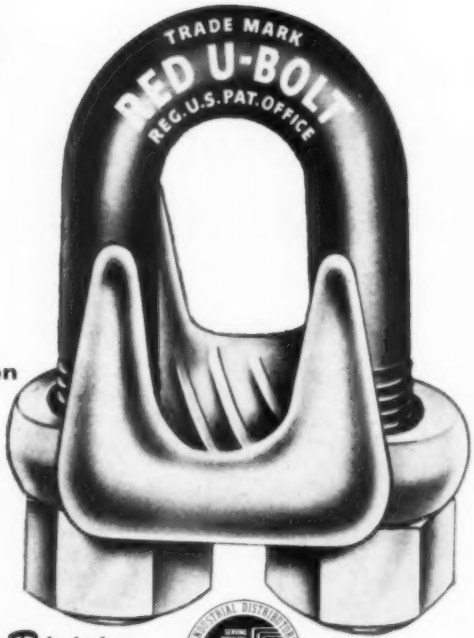
Enter 230-A on card, page 177

For SAFER wire rope fastenings . . .

GENUINE CROSBY WIRE ROPE CLIPS

Red U-Bolt* for instant recognition

- **Drop forged base**
- **Base grooved to fit rope**
- **Hot-dip galvanized . . resists rust and corrosion**
- **Standard heavy hex nuts**



Write for free specifications catalog listing the most complete line of drop forged fittings for wire rope and chain.

*Trademark

BE SURE TO SPECIFY
The Genuine CROSBY CLIP

Stocked by leading distributors everywhere.

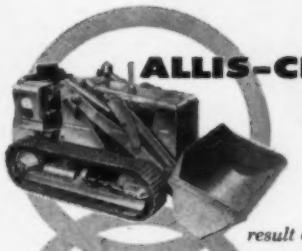
CROSBY-LAUGHLIN *Division*
AMERICAN HOIST & DERRICK COMPANY
FT. WAYNE, INDIANA

- **Proved in 75 years of service**
- **The Standard of the Industry**
- **The only clip line in size range from 1/8" thru 3"**

Enter 230-B on card, page 177

YOU'RE AHEAD

because the specialized experience of two pioneer companies in front-end loaders is now combined . . .



ALLIS-CHALMERS
—pioneer of the world's first successful hydraulically-controlled crawler-mounted tractor shovel.

result of 14 years' leadership

TRACTOMOTIVE
—one of the first to develop heavy-duty rubber-tired loaders.

result of 11 years' leadership

Now Tractomotive Corporation has become part of Allis-Chalmers . . . and that means we'll be able to serve you better than ever. One very important reason is that the specialized experience of each organization in its field cannot be surpassed.

Allis-Chalmers pioneered its history-making HD-5G in 1945 . . . has led the field in crawler shovel design and performance ever since . . . now offers the most complete line of such equipment in the industry, with bucket sizes from 1½ to 7¼ cu yd.

The Tractomotive team has been building heavy-duty wheel loaders since 1948 . . . has consistently pioneered developments of great value to users, including torque converter drive and single-lever shifting control.

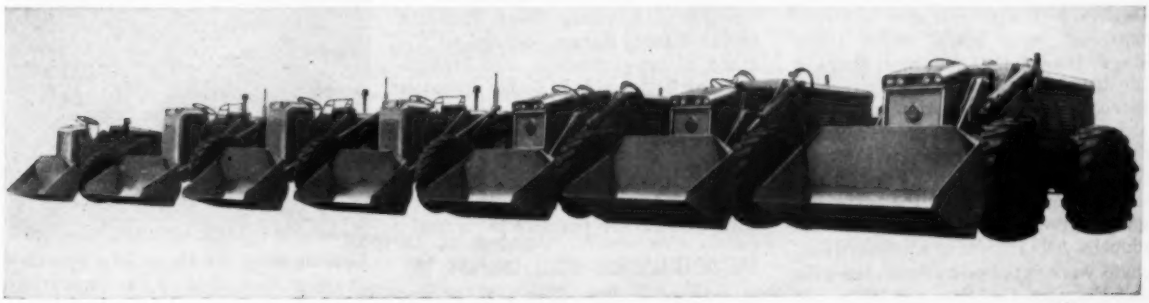
Through the combined facilities of these two pioneers, we offer you industry's most complete line of front-end loaders, on rubber or tracks . . . with these added basic advantages to back it up!

- another modern plant joins Allis-Chalmers' extensive facilities for manufacturing construction machinery
- a company-wide record of engineering leadership in all types of heavy-duty equipment
- widespread research activity that insures continuing progress
- original factory parts and blue-chip parts control
- increased man power in sales and service

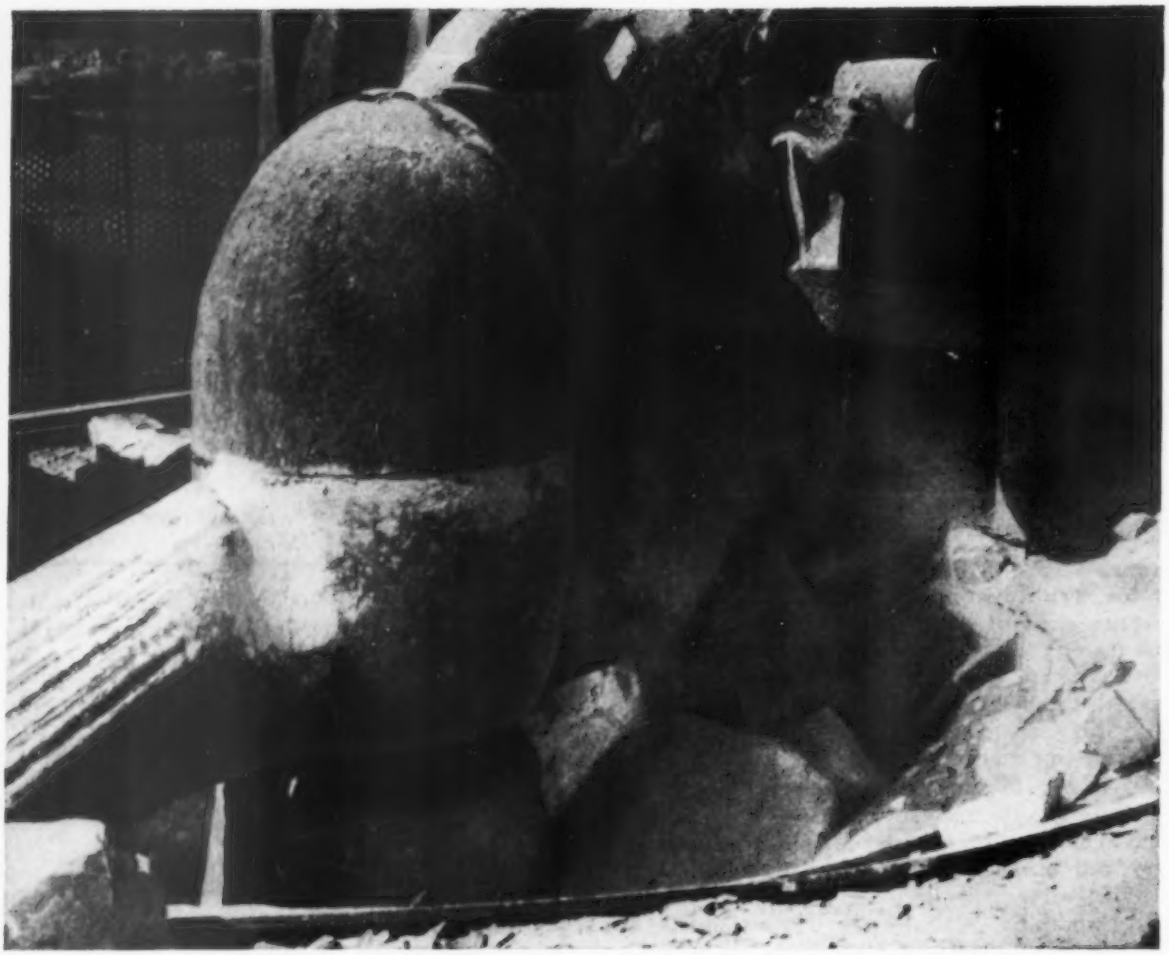
See 'em at work—your Allis-Chalmers dealer will be glad to demonstrate the machine of your choice—wheel or track-mounted, whichever meets your job needs best. Just give him a call. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

YOU'RE AHEAD **with a TRACTOLOADER** ...a complete line now built and backed by Allis-Chalmers

Seven models—34 to 130 hp—up to 9,000-lb carry capacity. Torque converter drive in every model.



move ahead with ALLIS-CHALMERS
...power for a growing world



Crushers like this – fitted with Ni-Hard concaves – are turning in impressive service records at Spencer Quarries, S. D. They crush Sioux Quartzite, which, like Taconite, is among the hardest known minerals . . . and it has a compressive strength of over 100,000 psi.

NI-HARD crusher concaves outlast manganese steel 3 to 1

At Spencer Quarries, Spencer, South Dakota, Ni-Hard* concaves in 6-inch crushers, have lasted three times longer than manganese steel rings in the throat area, where compression forces are highest.

In a 30-inch gyratory crusher at Spencer, Ni-Hard bottom ring concaves are in their third year of service—where previously the best manganese steel rings wore out in six months. All of Spencer's Ni-Hard concaves were supplied by Brom Machine and Foundry Co., Winona, Minn.

Whether crushing quartzite at Spencer or working tough Taconite on the Mesabi Range, economical Ni-Hard nickel-chromium cast iron is proving better able to resist abrasion and high compression forces than any other material.

Ni-Hard concaves are available from authorized producers throughout the country. For the address of the one nearest you, write to Inco.

*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.

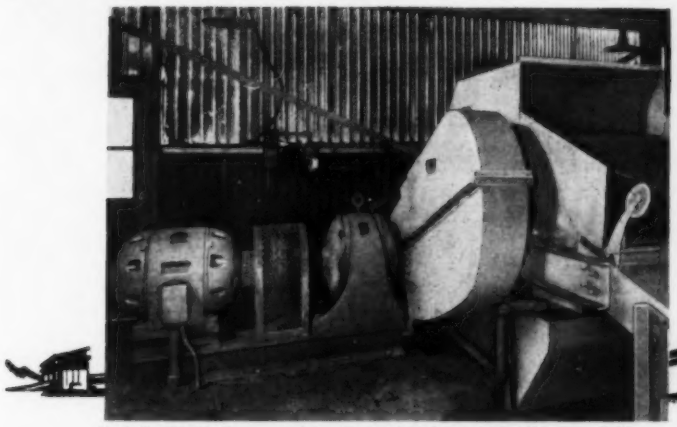
67 Wall St. INCO New York 5, N.Y.

Looking down the throat of a gyratory crusher. Concaves in the important lower ring are of long-lasting Ni-Hard.

NI-HARD

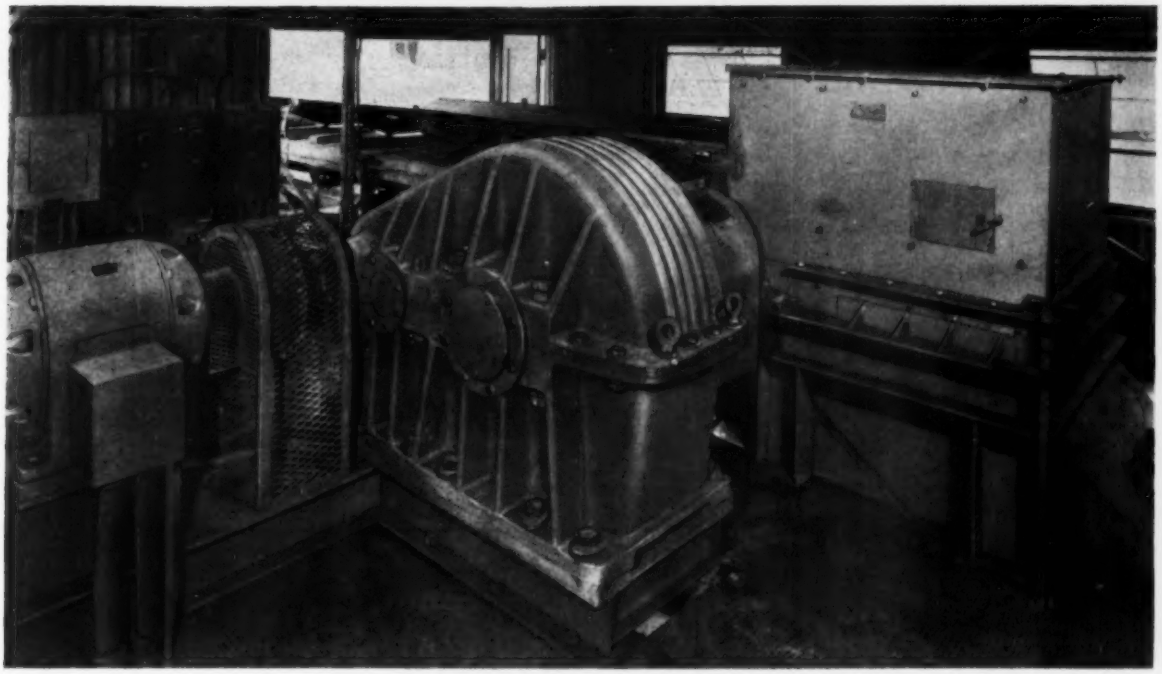
NICKEL MAKES ALLOYS PERFORM BETTER LONGER

FOOTE BROS. DRIVES IN THE CEMENT INDUSTRY



...Move Cement Clinker at 2000 TONS PER HOUR

LINE-O-POWER Reducer Driving Tunnel Belt feeding Final Conveyor Belt.



MAXI-POWER Reducer Driving Final Conveyor Belt, Universal Atlas Cement Plant, Buffington, Indiana

Lake carriers get a fast turn-around when they load clinker at United States Steel Corporation's Universal Atlas Cement Plant at Buffington, Indiana, because the clinker loading belts driven by Foote Bros. Reducers have a maximum capacity of more than 4 million pounds per hour!

The 48" wide, 2445 ft. long inclined Final Conveyor Belt, driven by a Foote Bros. MAXI-POWER Parallel Shaft Drive, which is fed by two 36" wide Tunnel Belts equipped with LINE-O-POWER Drives, moves the fused raw material from mountain-high stock piles into the holds of boats at the rate of 2000 tons per hour.

This is tough, demanding service. Drives are subjected to massive shock and maximum peak loads . . . yet the Foote Bros. Drives have never been shut down for emergency repair or maintenance!

Dependability like this is a standard by-product of Foote Bros. drive know-how. Why not take advantage of our more than a century of experience and specialization in building high quality transmission products?

There's a Foote Bros. Drive made to meet your power transmission requirement. Ask your nearby Foote Bros. Authorized Distributor for information or assistance concerning your power transmission problems. He's ready to help you.

100 YEARS SERVING INDUSTRY 1859-1959

FOOTE BROS.

Better Power Transmission Through Better Gears

Find Your Nearest Distributor In The 'Yellow Pages'

FOOTE BROS. GEAR AND MACHINE CORPORATION • 4571 S. WESTERN BOULEVARD • CHICAGO 9, ILLINOIS

ECONOMIZE

with built-in REOPCO*

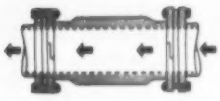
Massco-Grigsby Pinch Valves

...their Long Wearing Life makes them

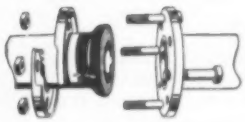
Cost Less to Own!

- **Rubber or Neoprene sleeves for abrasive and corrosive pulps and liquids**
- **1" to 14" inside diameter**
- **Pressures to 150 psi.**
- **Temperatures to 200° F.**
- **Manual or power-operated closing mechanisms**
- **Automatic regulation and remote control available.**

Patented "hinged" sleeve. Recesses serve as "hinges" during compression; reduce strain and permit tight closing.



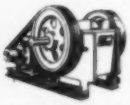
Unobstructed flow eliminates high friction loss.



Split flanges and Flex Seal ends assure perfect seal.

*Reduced operating costs.

and Laboratory Equipment, too



4" x 6" Massco Laboratory Jaw Crusher

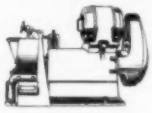
Welded steel frame; manganese steel jaw and cheek plates; bronze bushed bearings; smooth jaws give better product and easier cleaning. Adjust for plate wear and product size by convenient hand wheel adjustment.

6" and 10" Massco Gy-Roll Reduction Laboratory Crusher

Reduces ½" feed to as fine as 10 mesh in single pass. High capacity, low power consumption.

Laboratory Crushing Rolls

Sizes (Diameter x width): 8" x 4", 10" x 6", 10" x 8", 12" x 10" and 12" x 12". Adjustable roll space setting up to ¾". Double V-belt drive. Heavy, cast Meehanite frame absorbs vibration, results in long life.



Massco-McCool Pulverizers

Disc type grinder with a planetary movement. No gears. Will grind to 150 mesh in one pass.

WRITE FOR CATALOGS

Manufacturing Division

MINE AND SMELTER SUPPLY CO.

DENVER 16	NEW YORK 17	SALT LAKE CITY 1	EL PASO
3800 RACE STREET	122 E. 42nd STREET	121 W. 2nd S.	1515 11th AVE.

LICENSED MANUFACTURERS AND SALES AGENTS in Canada, Australia, Sweden, England, South Africa

SALES AGENTS in Peru, Chile, Philippine Islands, Japan, New York City (for Continental Europe) and in principal cities of the U.S.

FOR THE JET AGE... LONGER RUNWAYS AND VINSOL PLAYS ITS PART

Vinsol resin has long been recognized as the most economical air-entraining material.

Today, with a record billion dollars to be spent this year alone on new and enlarged military, municipal, and private airports . . . with highway construction proceeding at an accelerated pace . . . with new construction of office buildings changing the skyline of our major cities—the efficiency and economy of Vinsol as an air-entraining agent for concrete is more important than ever.

Since the concept of air-entraining was first introduced by the cement industry in the 1930's, Vinsol has been widely specified for use in this field. Write to Hercules for technical data explaining the many advantages of Vinsol.

VINSOL®

Naval Stores Department
HERCULES POWDER COMPANY
INCORPORATED
900 Market Street, Wilmington 99, Delaware

NV59-1

CASE HISTORIES

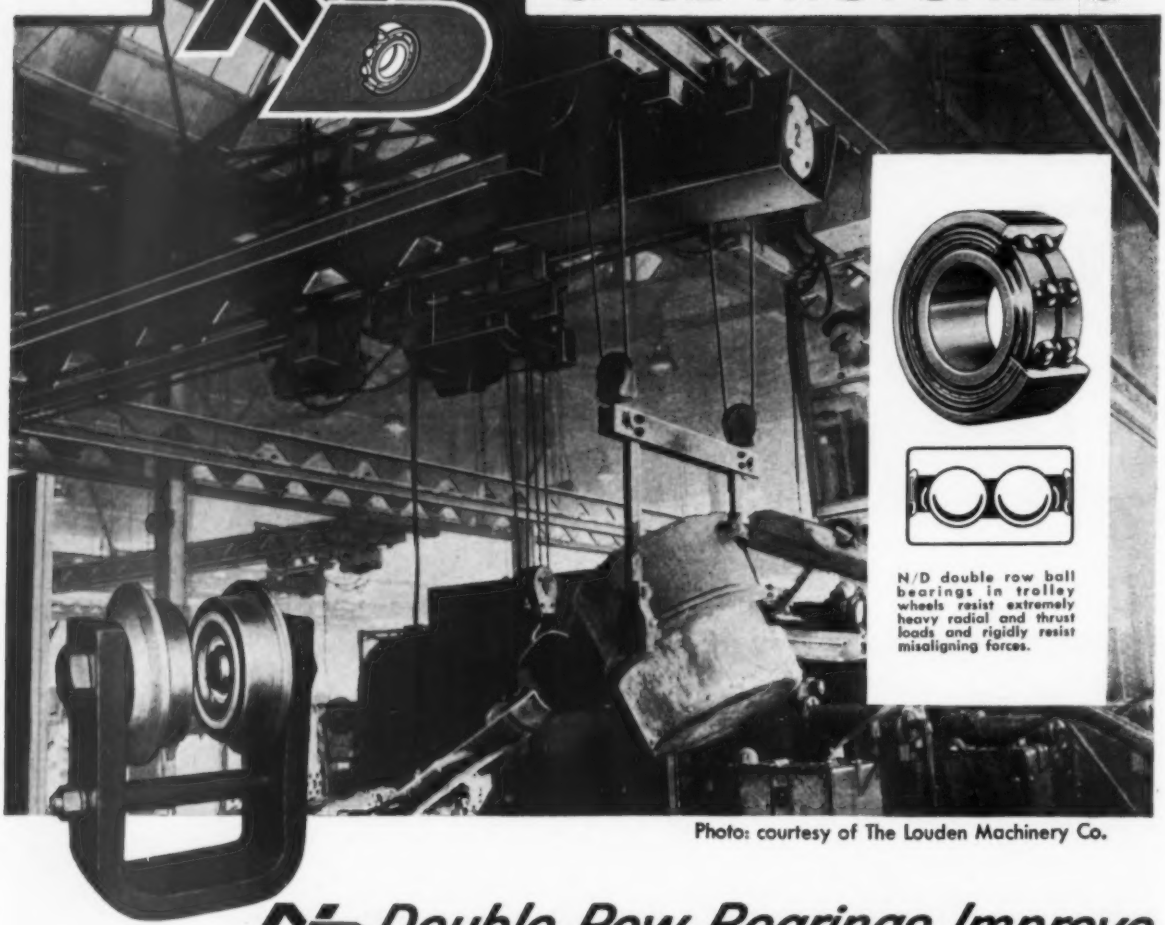

N/D double row ball bearings in trolley wheels resist extremely heavy radial and thrust loads and rigidly resist misaligning forces.

Photo: courtesy of The Louden Machinery Co.

N/D Double Row Bearings Improve Quality...Turn a 37¢ Saving Per Trolley Wheel!

CUSTOMER PROBLEM:

Improve quality and efficiency of trolley wheel assemblies which are often subject to heavy shock loads and contaminating conditions. Require sealed bearings which eliminate lubrication maintenance.

SOLUTION:

N/D Sales Engineer suggested New Departure sealed and lubricated-for-life double row ball bearings. These extremely efficient dual purpose bearings resist heavy radial and thrust loads . . . from every direction, and in any combination. In addition to this rugged feature, they shut out dirt . . . eliminate the need for relubrication because they're equipped with exclusive N/D Sentri-Seals. What's more, the single New Departure bearing replaces two separate bearings previously used on each side of the trolley wheel yoke to net a cost and assembly-time savings of 37c per unit . . . an approximate $3,300 in savings annually! The end user of these rugged, higher-quality trolley wheel assemblies receives long trouble-free, virtually maintenance-free, performance.

Chances are this bearing, or another of New Departure's wide selection of production bearings, will help lower production costs of *your* product. For more information, call the Sales Engineer in your area or write Dept. O-9.

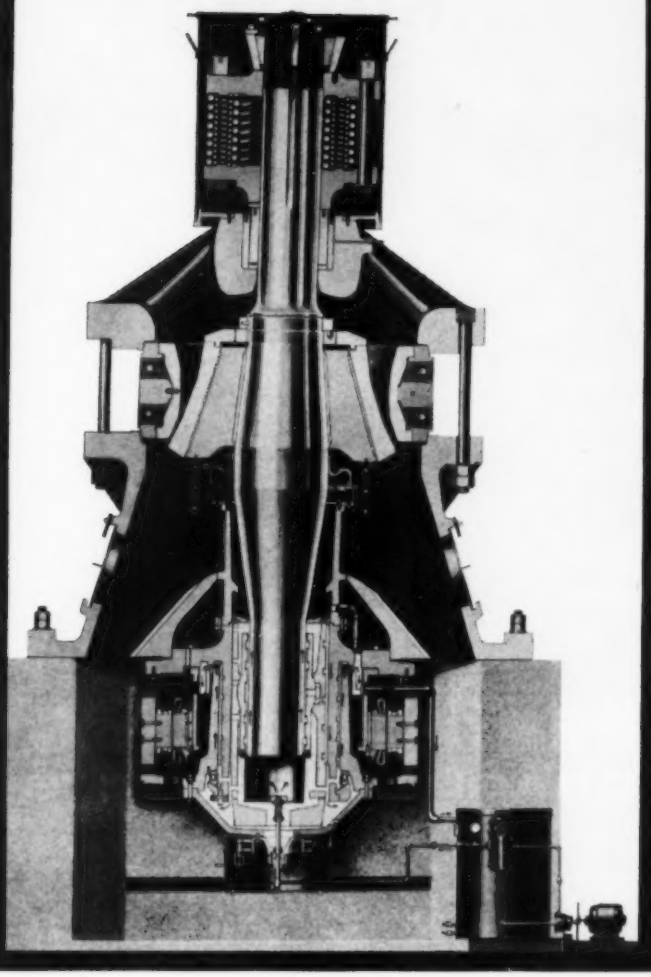
NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

NOTHING ROLLS LIKE A BALL

2-WAY TRAMP IRON PROTECTION

Exclusive with the KENNEDY Gearless Reduction Crusher



Ordinary tramp iron and uncrushable oversize is passed by the quick-acting, positive spring cage, without damage.

The KENNEDY patented built-in drive coupling with its overload device, provides positive protection against breakage from unusually large pieces of tramp iron. Operates only when uncrushable material enters crusher.

Uncrushable material inevitably finds its way into every reduction crusher. Only with the KENNEDY Gearless Reduction Crusher is absolute protection assured—for only KENNEDY provides 2-way protection against costly machine damage.

Write today for your copy of Bulletin No. 58-D describing the many other important features of the KENNEDY *Gearless Reduction Crusher.*

KENNEDY VAN SAUN

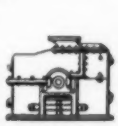
MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

Primary Gyratory

Cuber Senior

Cuber Junior



Hammer Mill

Roll Crusher

Overhead Crusher

Swing Jaw Crusher

THE MAN WHO BOSSES THE JOB ...KNOWS!

HENDRIX
DRAGLINE BUCKETS

..will handle the work!

Fill Faster

Handle Easier

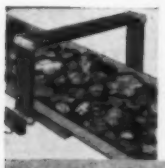
Dump Cleaner

"A Type for Every Digging Purpose"

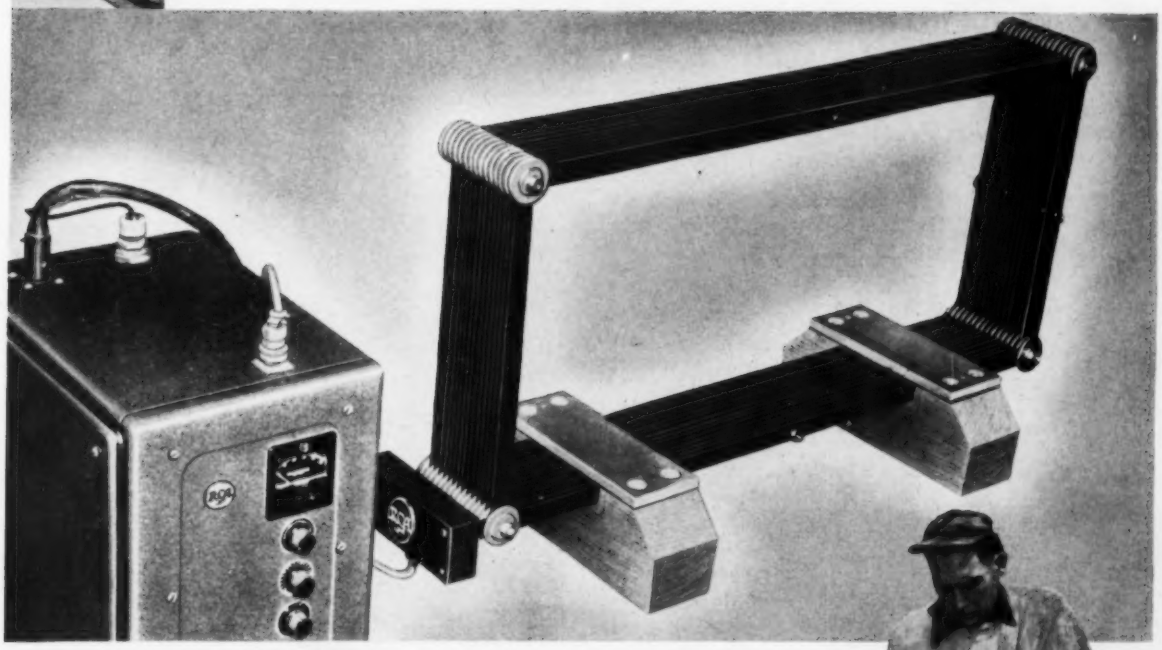
¼ to 40 Cubic Yards

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight DRAGLINE BUCKETS



...GATEWAY TO SAFETY FROM TRAMP METAL



New RCA Electronic Metal Detector Specially Designed for Quarries!

The new RCA Metal Detector aperture has been designed for heavy duty service and to withstand the rigors of humidity and moisture encountered in the quarry industry. Rugged components and built-in voltage regulation in the Control Unit provide efficient, trouble-free operation with a minimum of maintenance.

The basic system is made up of an inspection aperture of copper buss bar construction, and control unit. The aperture is available in a wide range of sizes to meet the requirements of various types of installations. Installation is made very simply around the conveyor belt, without need to dismantle the conveyor.

As the material passes through the aperture, the presence of tramp metal causes a signal to be amplified in the Control Unit. This signal is sent to a relay device which controls the motors of the conveyor, warning alarms or other types of rejection mechanisms. The simplified control system can be easily operated by your plant personnel. The RCA Service Company is available to provide supervision of the installation and offers a service contract.

"Detects the trouble that cripples crushers."

Locates tramp metal and sounds alarm. Protects valuable machinery against any metal object.

FREE *literature on the RCA Electronic Metal Detector for quarrying, mining, lumbering operations, will be sent to you without obligation. Write to RCA, Dept. R-236, Building 15-1, Camden, N. J.*

Tmk(s) ®

RADIO CORPORATION of AMERICA

CAMDEN, N. J.

In Canada: RCA VICTOR Company Limited, Montreal

Radio Corporation of America
Dept. Y-236, Building 15-1, Camden, N. J.

☐ Rush details on the new RCA Universal Metal Detector.
☐ Have a representative call to survey plant.

NAME_____ TITLE_____

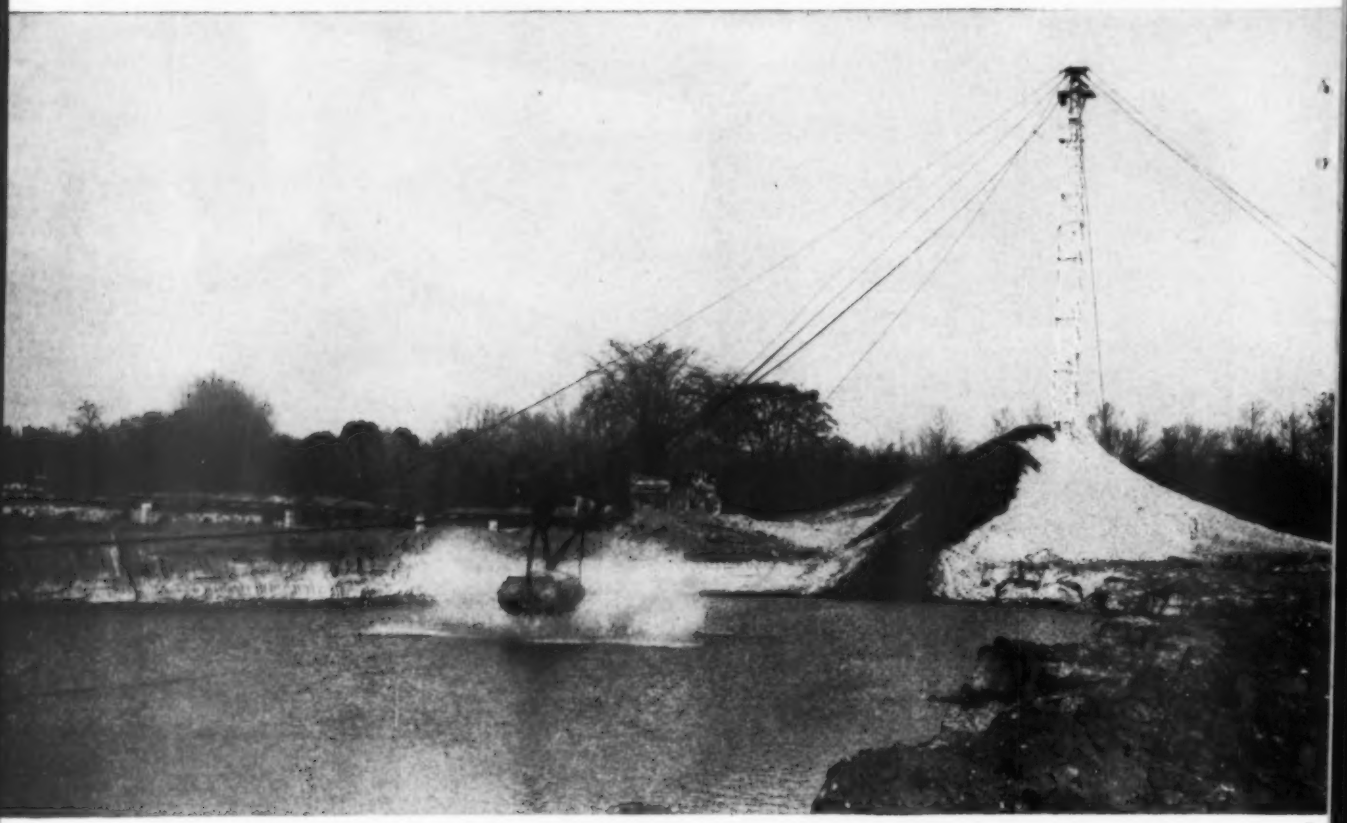
COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

USS Tiger Brand — America's No.1 Wire Rope used for more than 50 years

ON SAUERMAN SLACKLINE CABLEWAY EXCAVATORS



Low-cost method of digging sand and gravel with a cableway using USS Tiger Brand Wire Rope. Only one operator is needed.

This year Sauerman Bros., Inc. celebrates their fiftieth year of building slackline cableway excavators. Back in the beginning, engineers at American Steel & Wire designed and built a special wire rope for them known as the "Sauerman Special Excavator Rope."

This is a USS Tiger Brand Rope of superior quality that combines strength, flexibility and ability to resist abrasion, all essential in cableway operation. The rope has proved highly satisfactory, and Sauerman has used it exclusively during the past 50 years. This application shows why a rope that is *engineered for the job* will last longer and reduce your wire rope costs.

Sauerman Bros., Inc. carries a complete line of Tiger Brand Wire Rope for Slackline Cableway Excavators. For further information on USS Tiger Brand, write American Steel & Wire, Dept. 9190, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

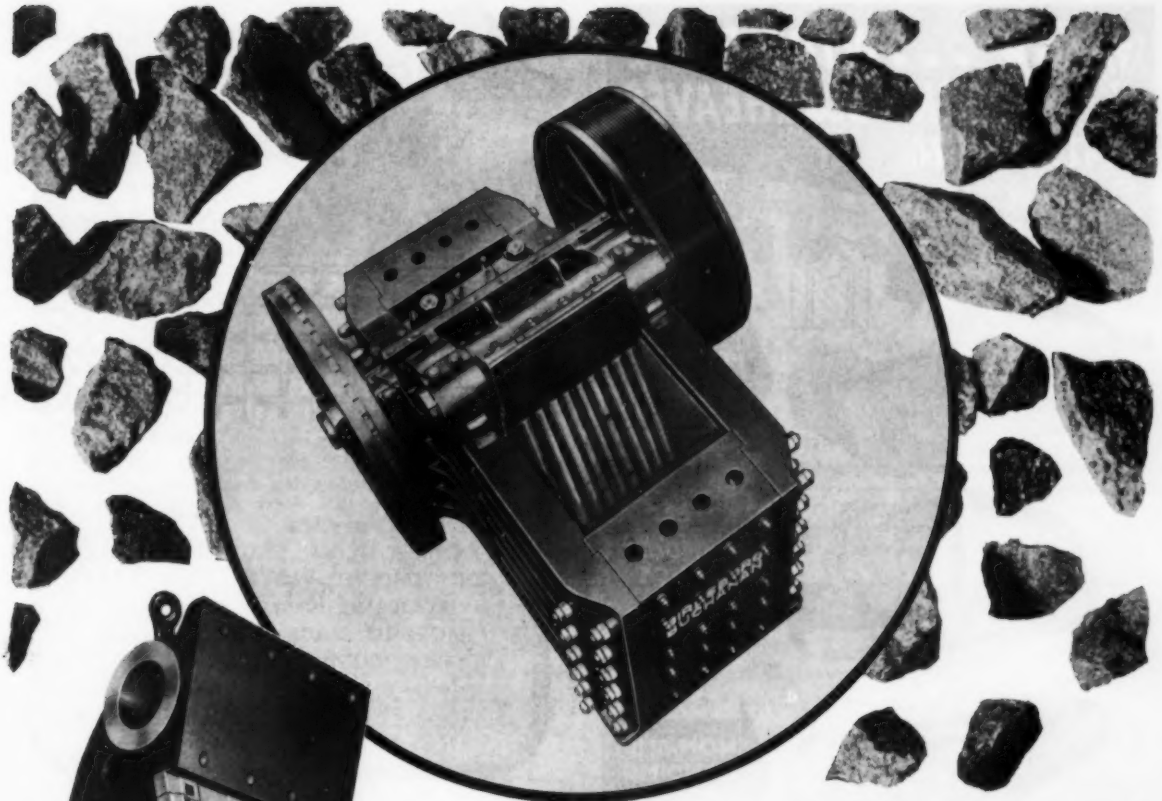
USS and Tiger Brand are registered trademarks

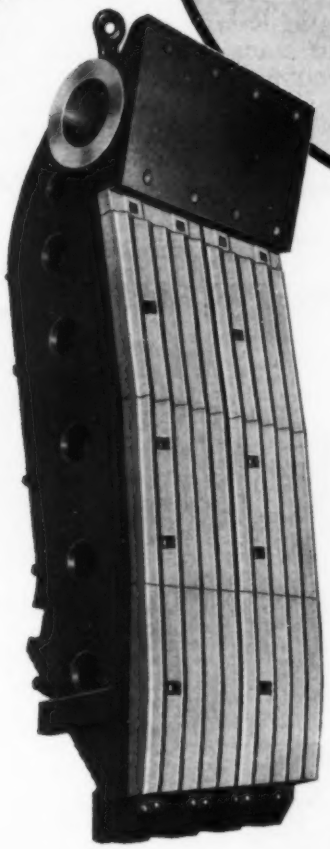
Why Tiger Brand is your best buy

1. It is made by a company that maintains the most complete research and manufacturing facilities in the steel industry.
2. It is designed by one of the country's most capable staffs of wire rope engineers. It is serviced by thoroughly experienced field representatives always ready with their assistance.
3. Every type of Tiger Brand Wire Rope is designed for specific applications. You get the right rope for the job.
4. It is made by one company, U. S. Steel, and every step of production, from ore to finished product, is carefully controlled and supervised to guarantee one high standard of quality.
5. Tiger Brand Wire Rope is manufactured by the foremost single wire rope producer in the country.

American Steel & Wire Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal and Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad



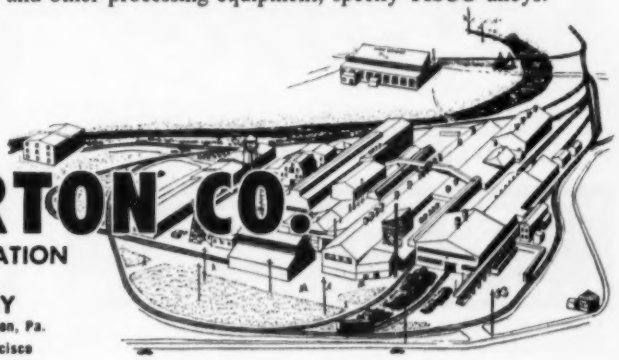


TOUGH TISCO®

Birdsboro-Buchanan Crusher Parts

Jolting impact and punishing abrasion are the destructive one-two punch of every stone-crushing operation. Obviously, a "pretty good" steel cannot stand up consistently and profitably under this constant sledgehammer pounding. That's why impact and abrasion resistant TISCO Manganese Steel jaw plates are used in Birdsboro-Buchanan Crushers. TISCO jaw plates last longer, keep production levels high, maintenance low.

Founded in 1742, Taylor-Wharton, the Original Producers of 12 - 14% Manganese Steel in America, has the know-how and experience in making special alloy steels with top impact and abrasion resistant properties. To find out how tough TISCO Manganese Steel alloys can up the output and decrease the down-time of your Jaw Crushers and other processing equipment, specify TISCO alloys.



TAYLOR-WHARTON CO.

DIVISION OF HARSCO CORPORATION

Established 1742

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F85 F-F . . . WIRE ROPE SOCKETS and SHEAVES

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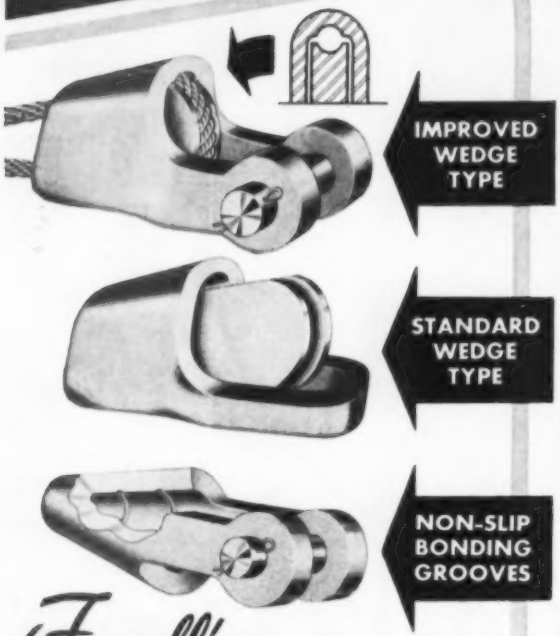
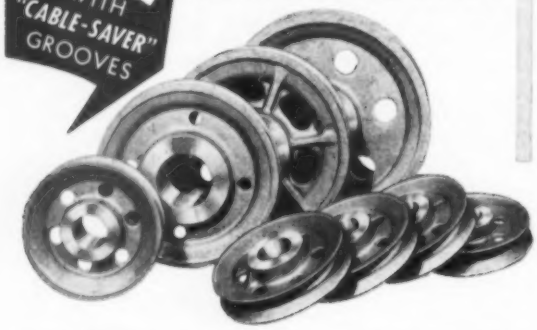


Farrell's Sheaves of F 85 Alloy and Carbon Electric Furnace Cast Steels . . .

FOR TOUGHNESS—RESILIENCY—AND RESISTANCE TO FATIGUE, WEAR AND ABRASION

WITH "CABLE-SAVER" GROOVES



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FARRELL-CHEEK STEEL COMPANY
SANDUSKY, OHIO, U.S.A.

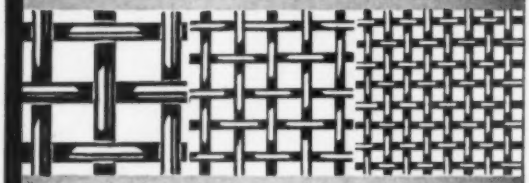
BUCKETS • SPROCKETS • CHAIN • WHEELS • GEARS • SHEAVES • CABLE FITTINGS • BAR BENDERS, CUTTERS • R. R. CASTINGS • FIRE TOOLS, ETC.

Enter 242-A on card, page 177

STRONG AS ARMOR

NAT-ALOY

Woven Wire Screens



Reliable Nat-Aloy woven wire cloth is specified throughout industry for maximum screening accuracy and economy. Available in flat surface, lock crimp, double crimp, rectangular and long slot openings. All sizes, meshes and gauges—prompt shipment.

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★ GREATER RESISTANCE TO ABRASION
★ MORE TONNAGE AT LOWER COST
★ FEWER COSTLY CHANGE OVERS

Write for information. Also stainless steel wire screens.

NATIONAL WIRE CLOTH COMPANY
252 W. Fairfield Ave., St. Paul 1, Minnesota

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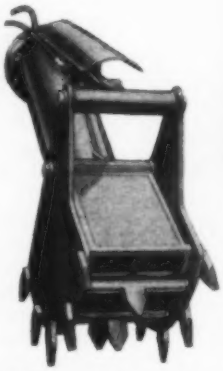
DREDGING PROBLEMS?



Van Gorp's "AGGRETATOR" is designed to increase production with a small investment

OUTSTANDING BENEFITS

How many tons of material do you loose every year in your dredging operation because of bad pumping conditions? Such as clay seams, large rocks or a cemented deposit. These conditions, of course, greatly reduce your dredging efficiency.

The Van Gorp "AGGRETATOR" will cut through clay seams, will push large rocks away from the suction nozzle and will loosen a cemented deposit.

The "AGGRETATOR" is easily installed on your present suction line. Existing power will be adequate to drive the hydraulic pump, and it is not necessary to build an expensive boom or to build a larger barge.

SIZES . . . Available For 6", 8", 10" or 12" SUCTION LINES.

WRITE FOR *Free* BROCHURE

Van Gorp Mfg. Inc.
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Enter 242-C on card, page 177

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431 S. Dearborn St. Chicago 5, Ill.

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Section

WANTED

Quarry Superintendent for small quarry. Location—New York State. Salary and bonus plan adequate.

Box No. PQ-240-J, c/o Pit & Quarry Publications
431 So. Dearborn St. Chicago 5, Illinois

WANTED

ASSISTANT SUPERINTENDENT OF OPERATIONS. Night Shift for Rotary Kiln Plant in Northwestern Ohio. In first letter state experience, qualifications, salary required and references.

Box No. PQ-229-H, c/o Pit & Quarry Publications, Inc.
431 So. Dearborn St. Chicago 5, Ill.

EXECUTIVE ENGINEER

Executive Manager desires purchase contract or profit sharing arrangement for a construction materials company. Civil Engineer, 49 years old with 25 years experience in large and medium size operations including ready-mix, sand and gravel (land and marine), stone quarry, bituminous concrete, concrete pipe plant, extensive labor negotiations and administration, plant expansion programs, cost reduction and planning, equipment evaluation, sales forecasts and analysis, market analysis, construction engineering, customer relations, sales techniques, reorganization; has good character and reputation and "know how" to make profit. Excellent references.

Box No. PQ-241-J, c/o Pit and Quarry Publications
431 So. Dearborn St. Chicago 5, Illinois

WANTED
A QUALIFIED CEMENT CHEMIST

Age: Not over 40 years.

Education: Graduate Chemical Engineer.

Experience: Practical cement making in all phases.

Knowledge: Familiar with the variable behavior of different cement compositions in concrete for multiple purposes.

Opportunity: With established cement manufacturing company in California.

Salary: Commensurate with present ability, with upward escallation from progress shown.

Replies confidential. Send photograph with application to

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MASTER MECHANIC WANTED

Large cement company needs master mechanic. Must have supervisory ability and be familiar with machine shop operations. In reply, give experience, references, and salary desired. Replies confidential.

Box No. PQ-201-D, c/o Pit & Quarry Publications
431 So. Dearborn St. Chicago 5, Illinois

Do you need three men but can only afford one good one? Mining, Geological and Explosive Engineer desires supervisory job. Location—north, northwest, west or midwest.

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ROTARY KILNS—DRYERS—COOLERS

1—Traylor 11' x 155' Rotary Kiln, 7/8" shell.
1—Allis Chalmers 9' x 130' Rotary Kiln, 3/4" shell.
1—Vulcan 8' x 87', 1/2" shell.
3—Louisville 6' x 50', 3/8" steel shell with 1/16" stainless steel lining.
2—Vulcan 7' x 80', 1/2" shell.
2—Vulcan 7' x 53', 5/8" shell.
2—Link Belt Roto Louvre Dryers, 6'4" x 24'.
1—Rennenberg 6' x 50', 3/8" shell.
1—Rennenberg 5'6" x 50', 3/8" shell.
1—Ruggles Cole 5' x 30', class A-8, Indirect Heat Dryer, 3/8" shell.
1—Allis Chalmers 4' x 40'.
1—Allis Chalmers 4' x 30', 3/8" shell.
1—34" x 30', 5/16" shell.
1—Traylor 90" x 18', 3/16" shell, 430 S.S.

MILLS — CRUSHERS — PULVERIZERS

2—Traylor Compeb Mills 7' x 27' with 1—500 HP & 1—600 HP motor 3/60/440.
1—Williams Hammer Mill, 300 HP.
1—A.C. 6' x 22' Tube Mill, 250 HP.
1—Smidth 6' x 20' Tube Mill, 300 HP.
1—Smidth 5'6" x 21' Tube Mill.
1—Hardinge 4½' x 24" Steel Conical Mill.
1—Denver 3' x 5' Continuous Ball Mill.
1—Telsmith Red. Crusher no. 46, 50 HP.
2—Kennedy #6 Gyratory Crushers, 50 HP.
5—Jaw Crushers 12" x 18" to 36" x 48".
1—Penn. Non-Clog Swing Hammermill, size 5060, Hopper opening 47" x 60", cap., 200-275 tons per hour, UNUSED.
1—Penn. Super-Thor Hammermill, size SXT-13, 250 HP.
5—Raymond Bowl Mills, Two Roll, 60 HP.
3—Bradley 6' Hercules Mills, 300 HP.
3—Raymond 5 Roll Low Side Mills.

AIR SEPARATORS—SCREENS

1—19' dia. Raymond Double Whizzer Separator with 100 HP motor.
1—14' dia. Raymond Double Whizzer Separator with 60 HP motor.
2—Gayco 8' dia. mechanical Air Separators.
1—Raymond 30" dia. Whizzer Separator.
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1—Tyler Hummer Screen 4' x 10' type 38 with V-52 Vibrators and Thermionic unit.

ELEVATORS—CONVEYORS

14—Bucket chain Elevators, 22' to 60' high.
1—24" Troughing Belt Conveyor 75', 7½ HP.
1—Robins 84" x 22' Conveyor, 15 HP.
1—Robins 24" x 14' Belt Conveyor, 3 HP.
1—Robins 18" x 30' Troughing Conveyor.
1—Fuller-Kinyon Conveying System, type H257, 100 HP.
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For Inquiries on Boilers, Diesel Generator Sets, Turbo Generator Sets, Steam Engines, write to our Department P-2

BRILL EQUIPMENT COMPANY

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FOR SALE

Hardinge Conical Ball Mill 4½' x 16". Oliver Vac Filter, 3' x 6' Type 316 S.S. Rotex Sifters—20" x 48" 2 Deck, 40" x 60" 2 Deck, 40" x 120" 5 Deck. Bucket Elevator 20" x 30", 10' High, Buckets 5" x 12".

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Multi plant cement company needs engineer. Opportunity for training and advancement. Give full details on background. Replies confidential.

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431 So. Dearborn St. Chicago 5, Illinois

Superintendent Wanted

Quarry or gravel pit experience. Location in the Middle West.

Box No. PQ-222-H, c/o Pit & Quarry Publications
431 So. Dearborn St. Chicago 5, Illinois

Plant Superintendent

Some experience in sand processing and handling. He must be industrious and willing to grow with the plant. The plant is located in the south and established in a resort area.

Box No. PQ-237-J, c/o Pit & Quarry Publications, Inc.
431 So. Dearborn St. Chicago 5, Illinois

FOR SALE

Concrete Plant, Aggregate Plant, 5½ Cu. Ft. Jaeger, Mixers Mounted.
Mining Equipment: Rail, Cars, Muckers, Locomotives.
Considerable amount of construction equipment.
Numerous welders, light plants and other pieces of small equipment.
All type of air tools.

Box No. PQ-235-J, c/o Pit & Quarry Publications
431 So. Dearborn St. Chicago 5, Illinois

For Sale

2—Rotary dryers, 6' x 36', ½" material
1—Traylor 4' x 40' rotary dryer
1—Link Belt roto louver dryer, Model 1003-30

Box No. PQ-224-H, c/o Pit & Quarry Publications
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FOR SALE

1—Telsmith engineered sand and gravel plant designed for 2 man operation.
1—Sauerman 5 cu yd rapid shifting scraper hoist with 330 hp GM Diesel engine and towers
1—Telsmith 10 x 36 jaw crusher
1—Telsmith 36S Gyrosphere
1—Telsmith 5' x 12' Triple deck Vibroking screen with spray bars
3—S-45 Butler single compartment bins
5—Barber-Greene permanent belt conveyors Total length 577', complete with all accessories and supporting structures
1—Barber-Greene 24" x 91' self propelled radial stacker

All motors, starters, switches and wiring included.

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2'x30'x⅜" Rotary Cooler
38"x27' Louisville Rotary Dryer
4'x20' Hardinge XA2 Rotary Dryer
4'x36'x½" Vulcan Rotary Dryer
5'x45'x5/16" Standard Rotary Dryer
5'x70'x½" Ruggles Cole Rotary Dryer
6'x25' Louisville Rotary Dryer
6'x50' Louisville Rotary Dryer
6'x60'x½" Vulcan Rotary Kilns
7'x50' Ruggles Cole Rotary Dryer
8'x60'x½" Rotary Kiln
8'8"x70'x½" Direct, Indirect Dryers
8'x115'x⅝" United Rotary Kiln
8'x125'x⅝" Beth F'dry Rotary Kilns
9'x100'x⅝" Vulcan Rotary Kiln

MILLS—CRUSHERS

15"x8" to 24"x18" Jeffrey Hammermills
C3-30 Pennsylvania Hammermill
30"x14" Allis-Chalmers 2 Roll Crusher
Size R322 Allis-Chalmers Crusher
42"x40" Superior McCully Jaw Crusher
20"x6" Bacon Type "B" Jaw Crushers
8'x11' Traylor Ball Mill
7'x24' Compeb Mills 3 Compartments
5'x22' Allis-Chalmers Tube Mills

Bucket Elevators, Troughing Belt, Screw and Apron Conveyors, Screens, Bins, Steel Buildings
TO FILL YOUR SPECIFIC REQUIREMENTS

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Euclid Model 27FD, 15 ton Rear Dump, powered by Cummins Diesel engine. Engine overhauled. Good tires. Good operating condition. S/N D-6205. $12,500.00 FOB ELIZABETHTOWN, KY.
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BUCYRUS-ERIE 22-T well drill fair condition
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BONDED QUALITY BARGAINS

BONDED ® TROUGHING IDLER CONVEYOR BARGAINS

CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2 7/16" diameter shaft.

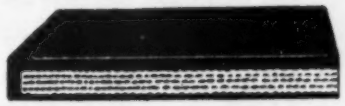
We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	$1397	$ 738	
14"	50'	2222	1159	$16.84
14"	85'	3377	1748	
16"	20'	1262	667	
16"	45'	2137	1118	18.04
16"	60'	2662	1388	
16"	90'	3712	1930	
18"	25'	1477	797	
18"	45'	2217	1182	
18"	70'	3142	1663	19.24
18"	85'	3697	1952	
18"	100'	4252	2240	
18"	130'	5362	2817	
20"	25'	1517	835	
20"	60'	2882	1548	20.37
20"	75'	3487	1854	
20"	90'	4042	2159	
24"	25'	1590	898	
24"	45'	2430	1334	
24"	70'	3480	1878	21.78
24"	100'	4740	2532	
24"	120'	5580	2967	
24"	150'	6840	3621	
30"	50'	2911	1617	
30"	70'	3871	2112	24.75
30"	90'	4831	2607	
36"	25	1818	1118	
36"	45'	2858	1677	27.85
36"	60'	3638	2096	
36"	100'	5718	3214	

TESTED CONVEYOR BELTING*

WE PAY FREIGHT ON 200 POUNDS OR OVER PLUS AN ADDITIONAL 10% SAVINGS FROM SALE PRICE FOR FULL ROLLS 500 TO 650 FEET.



Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile. Heavy Duty 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$3.63	$2.83
16"	4	4.08	2.97
18"	4	4.51	3.29
20"	4	4.97	3.80
24"	4	5.85	4.26
30"	4	7.18	5.21
36"	4	8.51	6.18

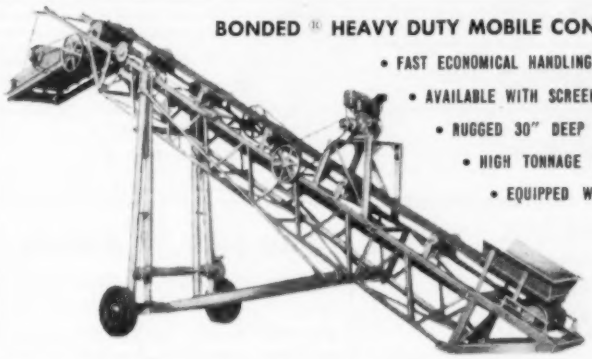
Major Bee Brand: 16# to 19# Average Friction Pull. 2400# to 3000# Average Cover Tensile. Skim coat between plies. A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$4.31	$3.06
16"	4	4.85	3.46
18"	4	5.39	3.83
20"	4	5.90	4.37
24"	4	6.94	4.94
30"	4	8.53	6.07
36"	4	10.09	7.35
24"	5	8.14	5.78

*All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

Other widths, plies, duck weights and cover thickness available at low prices. **WRITE FOR SAMPLE AND BULLETIN #1234.**

BONDED ® HEAVY DUTY MOBILE CONVEYORS



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- AVAILABLE WITH SCREEN AND FEEDER
- RUGGED 30" DEEP TRUSS FRAME
- HIGH TONNAGE AT LOW COST
- EQUIPPED WITH TOW HITCH

The economical solution to the need for a heavy duty conveyor that can be readily moved from one job-site to another. Available with mast or mastless type undercarriage and hydraulic powered mechanism. All standard conveyor accessories can be used. Lengths to 60 feet and belt widths through 30 inches. **Priced from $2365.00**

BONDED ® QUALITY BUILT BUCKET ELEVATORS

ENCLOSED ELEVATOR

Open or Enclosed, Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting. Bonded's 19 standard models mean lower prices and you get a Custom Built Elevator at no extra cost. Open and other types priced on request. There is a style of bucket for virtually every material or condition: wet or dry, lumpy or fine, granular, slivery, or pellet shaped, hot or chemically active.

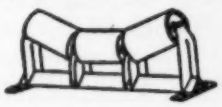
Prices listed at right are for Vertical Enclosed Elevators. Standard Elevators with Chain mounted buckets use #477 or #C102B combination chain, 4, 5 and 6 ply, 32 oz. or 35 oz. duck belt is used on Belt mounted Bucket Elevators.

Bonded Bucket Elevators are Jig Built to insure easy Job-Site Installation.

Model No.	Bucket Size Inches	First 20' (Discharge Ht.)	Add or Deduct Per Ft.
Style "A" Spaced Malleable Buckets on Chain			
C53A	5 x 3¼	$1071.50	$20.25
C64A	6 x 4	1088.50	21.00
C85A	8 x 5	1235.00	25.50
C106A	10 x 6	1281.00	27.50
C127A	12 x 7	1510.00	31.25
C148A	14 x 8	1673.00	36.00
Style "A" Spaced Malleable Buckets on Belt			
B53A	5 x 3½	$1099.00	$20.50
B64A	6 x 4	1116.50	21.25
B85A	8 x 5	1311.50	27.25
B106A	10 x 6	1692.50	33.00
B127A	12 x 7	1854.50	37.25
Style "E" Continuous Steel Buckets on Chain			
C85E	8 x 5 x 7¾	$1387.00	$31.25
C126E	12 x 6 x 11¾	1599.00	34.25
C108E	10 x 8 x 11⅝	1604.00	34.75
C128E	12 x 8 x 11⅝	1624.00	35.50
C148E	14 x 8 x 11⅝	1710.00	36.75
Style "E" Continuous Steel Buckets on Belt			
B85E	8 x 5 x 7¾	$1727.50	$34.50
B116E	11 x 6 x 8¾	1838.50	38.75
B128E	12 x 8 x 11⅝	2013.00	43.50

WRITE FOR BULLETIN #1203

BONDED® IDLERS & RETURN ROLLS SAVE 25% AND MORE



3-roll, 5" diameter Troughing Idlers for:			
14" belt	$19.75	24" belt	$22.75
16" belt	20.50	30" belt	23.85
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Minimum Curve Radius
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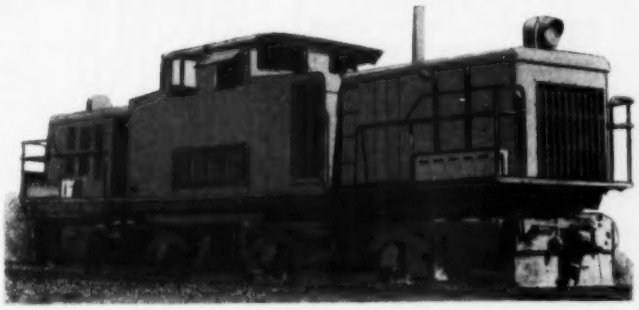

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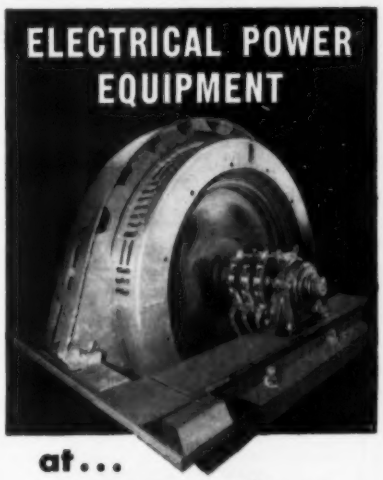

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5 Big Advantages of EUCLID'S TC-12 Twin-Power Crawler

Functional "years ahead" design, combined with unequalled power, makes the new series TC-12 the best all-around performer in the big tractor field. Its big power and big performance helps beat the pinch on profits...on every kind of big tractor work. Check these cost-cutting features:

Twin Engines with a total of 425 net horsepower . . . separate Torqmatic Drives each consisting of torque converter and semi-automatic transmission...more workability for heavy dozing, ripping, push-loading and towing than any other "super" tractor.

Independent Track Drives give the big TC-12 almost unbelievable mobility and maneuverability. With its separate power train and Torqmatic Drive, each track can work all the time because its power and speed is individually controlled. Operator has immediate, positive control for quick turns and side slope work.

Rigid Track Alignment is constantly maintained because each track is positioned to its main frame...each half of the tractor oscillates on a big diameter transverse shaft which provides maximum traction in rough going and increases track life. The tractor can be easily split into two halves for transport from one job to another.

Fast, Easy Operation is achieved by the separate Torqmatic Drives and simple controls. There's no master clutch...changes from one speed range to another are made under full power. Excellent visibility front and rear, and comfortable operator's seat, help to increase productive capacity. Good machine balance and stability, and "fast on its feet" performance, make the TC-12 unequalled for any big tractor work.

Service Accessibility that cuts downtime to a minimum is a feature of TC-12 design. Unitized assembly of converter, transmission and drive case components permits fast servicing or replacement without major tear-down of other parts. For example, both drive sprockets can be removed or replaced in about one-third the time required for the same work on a competitive big tractor. Planetary final drives can be serviced without breaking track or pulling sprocket.

Whatever the job, if it's a big tractor application the Euclid TC-12 will bring the best return on investment... the Euclid dealer in your territory can prove it!

EUCLID Division of General Motors, Cleveland 17, Ohio

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BIG BLAST, BIG JOB, BIG AMERICAN, BIG RESULTS

When 2,100 pounds of dynamite crumbled solid limestone at the 60-year old Riverview Stone and Material Co. quarry, Florissant, Missouri, the shattering blast signaled the entry of a heavy duty American 700 Series shovel to pick up.

Stretched out under 16 to 18 feet of overburden, the stone was drilled with 30 holes, 3½ inches in diameter and 30 feet deep. The dynamite explosion brought down countless thousands of yards of work for the eager American.

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Unit Pulverizes from 204 to 216 Tons Daily of Coal Containing as much as 12% Moisture

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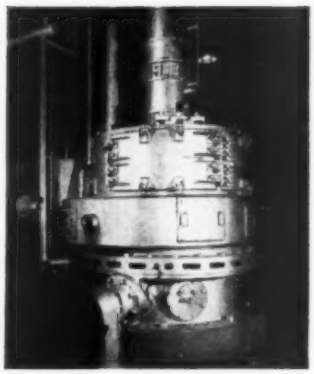
Throughout the cement and rock products industry, performance records like that turned in at the Cape Girardeau Plant, have earned B&W Pulverizers a reputation for dependable, efficient, and economical grinding service. If you're thinking of building a new cement plant or perhaps modifying your existing facility, a B&W Pulverizer can help you cut operating costs and improve over-all plant efficiency. For the complete story, get in touch with your local B&W representative, or write The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.



B&W EL Type Pulverizer at Marquette Cement Manufacturing Company has ground an average of over 72,000 tons per year since its installation. No unscheduled shut-downs required for maintenance.

C-220

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

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No. 246

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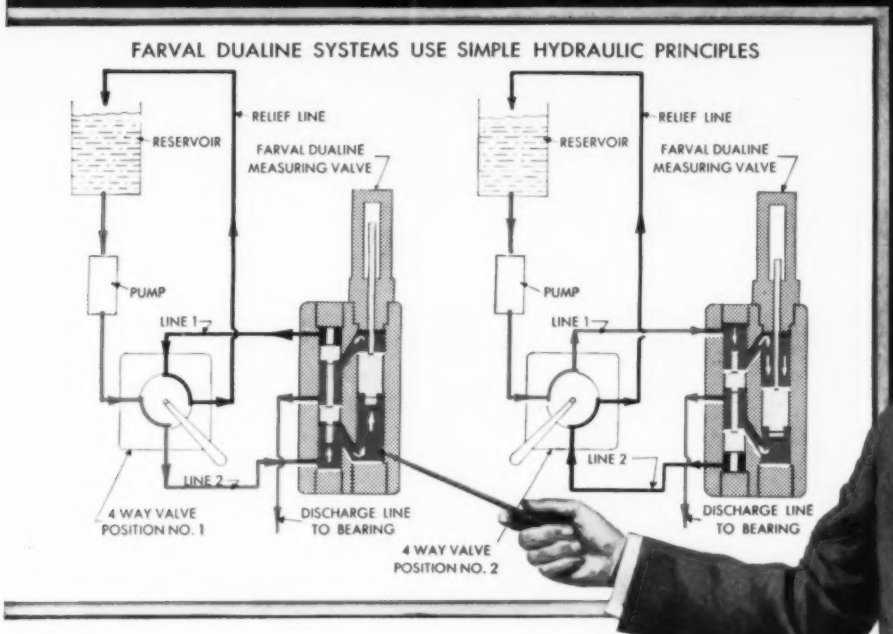

With Farval Dualine centralized lubricating systems you get the following distinct advantages over other type systems . . .

(a) Much lower operating pressures with consequently less danger of soap separation on grease systems. Also, less danger of system damage due to high lubricant pressures.

(b) Large lubricant passages with no pinhole ports, ensures practically full pump pressure for every metering valve. This is one of the reasons why Farval Dualine systems operate on lower pressures — give less sieving and working of lubricants.

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(d) Each metering valve individually adjustable for the requirements of the bearing it serves.

(e) Independent metering valve operation. Should trouble develop with one valve, the system will continue to operate. Only one bearing (not all the bearings) will require hand lubrication until trouble is corrected.

(f) True lubricant metering. Quantity of lubricant delivered to one bearing is not dependent on any other valve in the system.

(g) Much easier to spot and correct trouble.

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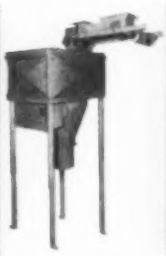

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